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CURRICULUM PROGRAMS IN ACTION, THEIR ADMINISTRATION AND EVALUATION; REPORT OF A CONFERENCE DEVOTED TO DESCRIPTION, DEMONSTRATION, AND EVALUATIVE DISCUSSIONSOF INNOVATIVE PROGRAMS IN VOCATIONAL-TECHNICAL EDUCATION.

San Francisco State Coll., Calif. Center for Technological Education.; Wisconsin Univ., Madison. Center for Studies in Vocational and Technical Education.

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CURRICULUM PROGRAMS — IN ACTION —

Their Administration and Evaluation

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CURRICULUM PROGRAMS IN ACTION

THEIR ADMINISTRATION AND EVALUATION

1966 est

Report of a Conference devoted to description, demonstration, and evaluative discussions of innovative programs in vocational-technical education.

Sponsored jointly by

CENTER FOR TECHNOLOGICAL EDUCATION
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INTRODUCTION - CONFERENCE OVERVIEW

J. Kenneth Little, University of Wisconsin

This conference resulted from a conversation between Dr. George Champion, Director of the Center for Technological Education here at San Francisco State College and myself, about the desirability of providing an opportunity for presentation, review, and evaluation of innovative programs now in operation across the country. Since a number of these programs had originated in the San Francisco area, particularly those with several years of experience, it was felt that this location was appropriate. We believe the following underlying facts, situations, and assumptions set the stage for the topics of this conference.

First, three-fourths of American youth leave the formal school system between the junior year of high school and the junior year of college. Given the widely varying abilities, interests, and inclinations of youth, this leave-taking from school is probably to be expected. But youth should not leave for the wrong reasons—inappropriate educational programs or artificial barriers to educational opportunity.

Second, the target area in education, then, is described as "middle education"—the school program designed for the great majority of youth who make the transition from school to work rather than from school to the four-year-college. The object is to provide the kinds of learning opportunities which make them employable, promotable, and flexible in adapting to occupational change. It is also essential that society find places for useful and satisfying work opportunities for persons at varying degrees and levels of schooling.

Third, the school program needed does not call so much for changes in substance as changes in focus. The need is to arrange learning experiences which show the relevance of knowledge to activities and interests of the life careers and expectations of persons who will be occupying the great range of middle-level occupations in our society. The program calls for teachers who are sensitive to the needs of youth in this range of potentialities and who are ingenious in arranging, with other like teachers, the type of learning activities which make a difference to their students.

Fourth, we believe that experimentation with new ideas and innovative practices, coupled with systematic evaluation, is a value to be cultivated in school systems.

So we put together the program for this conference with a view to provide its participants with knowledge about curriculum activities in operation around the country, and to discuss its nature and operation with the people who are directing them.

For informational purposes, the Center for Vocational and Technical Education at the University of Wisconsin has five major types of activities:

1) Research on fundamental problems underlying vocational and technical education. In this effort we are helping research workers in many fields to turn the lights of their discipline on central and pertinent research problems. Currently, we are giving assistance to research projects being undertaken in economics, psychology, industrial relations, industrial psychology, counseling and behavioral studies, educational administration, political science, and agricultural education.

2) Informational services, in which we are collecting and disseminating lists of bibliographical references on selected or special topics in vocational and technical education to interested research workers and practitioners throughout the nation. More than 1,500 names are now on our mailing list for this reference service. In connection with this activity, we are assembling a collection of research and research-related documents which is available for study to persons who visit our Center. Later, we hope to develop the capability to disseminate abstracts or copies of some of the documents through use of some of the newly developed reproduction techniques.

3) Publications of the Center include newsletters, proceedings of conferences, a newly established Journal of Human Resources (published quarterly), and annual reports.

4) Conferences, institutes, and seminars are sponsored to bring together research workers and practitioners for exchange of information and viewpoint.

5) Assistantships, internships, and fellowships are sponsored to encourage and assist persons to undertake graduate studies in preparation for or in extension of leadership service to the field of vocational and technical education.

MAKING EDUCATION RELEVANT

Marvin Feldman. The Ford Foundation

I want to take advantage of this opportunity to talk about relevance in technical vocational education with a sense of urgency that is accelerating. A colleague of mine at The Foundation introduced me recently to an article that appeared in the Harvard Educational Review. written by two men named Harmon and Simon, who fictitiously describe what happens when a school superintendent prescribes the study of the local telephone directory for all seventh grade social studies classes. After the directory had been distributed and the teachers instructed in the fact that they must now teach the telephone directory, certain kinds of things took place in the classroom that are relevant to what we want to talk about. Incidentally, at first the teachers were terribly disturbed about this new innovation and thought they hadn't been properly trained in their pre-service education for telephone directory instruction. The superintendent assured them they had received a grant from the National Science Foundation. They held a workshop in order to provide the teachers with the relevant background necessary to teach the telephone directory. The authors go on to describe the human relations teacher who started off his class with "Boys and girls, we are going to have an exciting new unit this term. As a way of studying our city we are going through this amazing collection of information which tells us about the melting pot our city has been." The more traditional teacher approaches it with, "You better study this stuff because we are going to have an examination in February." The personalizing teacher's introduction to the telephone directory is, "Now children, you wouldn't want to hurt my feelings by not memorizing just a few names and addresses." Various homework assignments, teaching aides, objectives, and activities were developed during the course of the term and were geared to making the directory come alive. It was so successful that the project was extended to other grade levels and other subject areas. A colleague of mine at The Foundation extends this fiction a bit to make another point. He tells us that publishers became interested in the project and textbooks with teaching manuals began to hit the market. Meanwhile, somebody had the bright idea of applying to The Ford Foundation for a school improvement grant. Negotiations were carried out and the school system received the grant. The

The first thing they did with all this extra money was to establish team teaching. Those teachers who had the best background in telephone directory were responsible for large group instruction, while the others gave more individualized attention to small groups of learners. The teaching machine corporation was contracted to supply programed materials to help the learner master the names and addresses in small, carefully sequenced steps with immediate reinforcement. Educational television was utilized to bring some of the most dynamic teachers into the classroom to introduce the telephone directory. Amidst all this activity, the national government officially declared a war on poverty, and this led to the discovery that there were disadvantaged pupils within the school system. It was noted that while most children were able to get through the "Hs" by the time they were in the fifth grade, the disadvantaged child was still in his "Cs". Thus he was about five letters behind in his telephone directory work. So now the school focused in on this problem. It was thought that because the disadvantaged came from a deprived background, they were lacking in those experiences which would enhance their readiness to learn the directory. A variety of programs and strategies again were introduced to compensate for these deficiencies. Field trips were assigned so that the child could begin to experience the real streets and associate them with the abstract symbols in the telephone directory. The parents of the disadvantaged were instructed in how to read a few pages in the telephone directory each night to their child before he went to bed. And through the yellow pages attempts were then made to illustrate the city scenes and the people. (Later, of course, the yellow pages were taken out and introduced as part of the vocational education program in the school system.) This goes on and on but I think the point is well made.

What do we really mean by relevance and relevance in *education? You know,* since the end of World War II, two forces of social change have been on a collision course. And our nation today is under critical tension as a result of the loss of confidence between people we could call the civil rights movement and the public schools. And the paradox of the current struggle is that the goals of these forces are not fundamentally opposed to each other. What appears to be conflicting ideologies is due to the failure of both groups, public schools and civil rights, to meet these same goals they're after in economic and social development, even though they have used diametrically opposed strategies to get there. There are thousands of people dedicating their lives to forwarding a movement against the ignorance which plights our society, I found both in the civil rights movement and in the public schools. Yet we find the civil rights movement today has turned almost into an uncontrolled social revolution. And we observe our massive educational system as truly a victim of its own rigid power structure. The new emerging leaders of minority groups across our land tell us that the guardians of our public schools have failed in their trust. Moreover, we are told in no uncertain terms, as in the case of Intermediate School 201 in New York City recently, that the explosive eruptions of pent-up human frustrations in the ghettos can be blamed directly on institutions of education which have been unable to provide millions of Negroes, migrant laborers, marginal displaced farmers, with skills that would make them employable. On the other hand, we find many conscientious, sensitive officials in our public schools who have found no way to break the power of those staunch, well-meaning defenders of the status quo in the kinds and numbers necessary to provide alternative opportunities in manpower development.

Though time is running out, I still think there is time for those who have accepted the privilege of leadership in social reform, education, business, and industry to make a mighty effort to blueprint a plan of reform (for both public education and for the civil rights movement) to launch a new direct attack on poverty, both from the compensatory and preventive points of view, to decrease teenage unemployment, Negro male underemployment and to accelerate general economic and social escalation. There is still time to provide every man access to whatever knowledge and skills he requires to match his own individual talents. There is still time to retreat from those programs that have proved unworkable and to advance those that appear to be working.

Most thinking people today realize that minority groups are plagued with overt or covert discrimination and inferior education which mitigates against their subsequent employment at higher level tasks. Most thinking people anguish over the functional illiterates which swell the numbers of the unemployed. Most public school officials are sensitive to the need of providing meaningful skills, particularly to ghetto teenagers. Knowing that poverty and the lack of schooling heavily concentrate among Negroes is to state the obvious and the civil rights movement has helped to bring about some integration of schools, some desegregation of housing accommodations, and, under pressure from the federal government, Negro civil rights groups and thinking corporate executives in most major national corporations are stepping up the employment of Negroes. But the front is a shallow one. Few Negroes have found better jobs and the most critical piece of unfinished business between industry and the Negro movement concerns jobs. In terms of employment, the Negro goal is to convert these marginal, tokenal gains into substantial participation in the economic life of our country. No one knows how this can be done without a long range educational and training plan. Most people in both the civil rights movement and education know that the job will be difficult. It will demand complex strategies including continual pressures for voter registration, economic boycotts, and housing demonstrations. But the battlefront, nevertheless, has shifted from civil rights legislation to opportunities for economic improvement.

Civil rights leaders I've spoken to recently have little patience with the argument that jobs and the path to a higher income are based only on the expansion of the economy, since our current tight labor market has had little effect in reaching the hard-core unemployed. They will also not consider for a moment the notion of a normal 3% to 4% unemployed labor force when the majority of the unemployed are Negro males.

The classroom teacher in our public schools is also becoming impatient with the lack of tools to provide alternative processes in learning and training programs to widen the option of public school children. And as minority groups become more and more frustrated at the apparent continual denial of the great American dream; as school teachers become more and more militant in their anger over the lack of informed educational management, the organization of local community groups without informed leadership results in the kind of chaos we've recently experienced in New York City. We find a power struggle taking place not only within the civil rights movement, but within public education as well. And if you'd had some of the experiences we've had recently I think you'd feel the sense of urgency and fright that I feel now.

These very forces in the early 50s marshalled in our bewilderment at having been bested by the Soviet Union. Dramatic scientific achievement resulted in significant changes in the educational system which in the long run has aggravated our desire to serve the ghetto child and to prevent the need for adult compensatory programs. You know we now have the new math, modern physics, programed instruction, computer-assisted teaching, and instructional T.V. That these new inputs are vastly superior to the traditional processes is not the point. The point is that up until now concern has been in shoring up and in the improving of an education process in a crumbling educational model without basic changes in the design of the model itself. The new improved inputs have made the system itself out of date, out of touch, and out of balance. And most thinking school people know this. There have been commissions on objectives of education, conferences on school planning, and an investment in money for education by foundations, government, and industry, since 1950, which staggers the imagination. The public schools do want to prepare more than the 20% of the youngsters it serves. The public schools do want to become student oriented. And the public schools do recognize that the need for this reorganization and curriculum revision is obvious and well documented. We have to be reminded again and again that the staggering amount of federal legislation recently brought about (beginning with the 89th Congress) has been the result of intensive lobbying efforts by public school officials.

The point I want to make is that we have to turn attention now to the plight of the youngsters who are not being served in the kind of educational processes that we've recently developed in improving education, which turns me to our notion of relevance. I do believe in the American public school system and I'm very proud of American education. I'm proud of American education for never having recognized a class system or elitism. You know we're pretty good. I think the overseas assignments we've had recently have sort of intensified my pride in American public education. If we compare ourselves with the common European market countries, we really are good. We talk about 20%-25% of our youngsters that are completing higher education when 4% or 5% of the European counterparts are reaching this goal. But because we are good and because we do have a capability we have to be critical (and I'm going to be particularly critical of public education because I think they can make some other kinds of changes). and my criticism is that public education has become interested recently in the vocational system for what I think are the absolutely wrong reasons and is approaching it absolutely from a wrong perspective.

Now my thesis is that vocational education is not a separate discipline and it cannot be treated the same way we approach mathematics, English, or the physical sciences. It is rather an approach to the disciplines which, when properly used, could reconstruct the American educational system for greater relevance and bring about a total renaissance of liberal arts studies. Now in what follows, I'm going to ignore all the other forces which shape learning. I'm going to ignore the home environment, the society of the street and so on, and focus only on the schools. This isn't because I don't believe the other forces have any influence on learning, but I believe that the schools have the greatest influence and could influence the other forces if certain processes were introduced. Concern for vocational education always rises during periods of crises and there is little doubt that much of today's social unrest is a result of the steady decrease in availability of jobs for the unskilled, with a simultaneous increase in terms of the number of people who are totally unprepared to meet the demands of skilled employment. Now the roster of reasons (I'm so tired of these terms because you have head them so many times)—the advancement of automation on all fronts (business, industry, and agriculture), the disappearance of whole job categories, the increase of technical content in many of the surviving occupations, and the obsolescence of skills within occupational categories. Jobs now require more mental ability, fewer physical skills, a higher educational attainment at the entry level, and greater versatility over the productive lifetime of the worker. These all tend to sharpen the line between idleness and employment, dependence and independence, hopelessness and fulfillment. The trouble with the analysis, however, is that it places the blame on the job, the market, society—everywhere but where the responsibility mainly lies, in schools and in colleges. The primary reason there are more unskilled competing for fewer jobs within their capabilities is that the schools have failed to prepare them for today's work world. Now some other culprits might be named: failure of the apprenticeship system because of its high cost to industry, obsolete content of restrictive union practices, etc. But primary responsibility for insuring that young people are prepared to function productively in adult life lies with the educational system from kindergarten through college.

What has gone wrong? On one level the deficiencies are fairly clear, failure to bring outmoded training facilities into line with on-the-job working conditions; failure to provide effective vocational guidance to a large enough group of students; failure to make changes in the training content itself to meet the new needs of the job market. But there is a broader and more subtle deficiency which pervades the educational system. And it goes back to the time when general studies and vocational studies were conceived as separate tracks leading to separate life goals. The former for preparation for liberal or professional higher education, and the latter for those who lack either the means or the skills for the former. It also goes back to the time when vocational education (manual training they called it then) was used first for school delinquents and acquired a lasting stigma as an inferior form of instruction. Vocational education is assigned the role (I don't care how you put it, this is what happens) of taking over education at the point where the pupil is rejected by the general program. This may happen in early years. This may happen in later years. This may happen for adults. At a point of rejection, vocational education takes off. And today's rallying cry for vocational education arises from the recognition and the fear that our educational system may darn well break down (especially in the city) with the schools' inability to cope with the heterogeneous student input. Further enthusiasm comes from the fact that additional training is one way of providing the higher skills required for today's world of work, the concomitant thrust towards universal higher education, and the challenge of meeting the needs of a much more diverse student population in post-secondary education than ever before.

Vocational education has not lacked federal assistance: the Smith-Hughes Act, the various New Deal legislative actions and amendments, the National Defense Education Act, the Vocational Education Act of 1963, and the anti-poverty legislation of the last three years have increased annual federal appropriations to approximately 2/3 of a billion dollars. Unfortunately, most of this money has been earmarked for either the achievement of short-term goals or for training programs outside the regular school system, such as manpower development and training, opportunities industrialization centers, Office of Economic Opportunity feeder centers, neighborhood youth core centers, and various forms of skill centers. So the dichotomy is perpetuated.

If we accept the proposition that the proper role of vocational education is to be the custodian of those who fail to make the grade in some more general (and somehow better) system, then we are going to evade the real test which is to improve the entire process of education. That such improvement is needed is clearly underlined by the fact that the two track system in most school systems itself has been augmented by a third track, a watered-down general curriculum.

Now, there are many ways to describe students in our public schools. There are those who plan and do complete four years of college; those that complete two or more years of a community college or technical institute; those who do not complete any program in any formal education beyond the high school; and those who do not graduate from high school. We are ready to assume that the difference between these types is really some kind of native intelligence. The really striking difference among them, however, is probably only the degree of their ability to verbalize. This is a skill that is understood and rewarded by our school system. The point is that some children who are less verbally gifted and who do not look at things from an abstract point of view, ones who do badly in the conventional education courses, can learn the content of general education through the very techniques and processes of vocational education. These children can learn and can learn more quickly if presented the material of general education in concrete, not abstract, form, and if allowed to demonstrate their understanding of the knowledge in processes other than verbal. Concern for vocational education has rarely been focused on its proper place and process within the education system. This has served to distort its objectives, cloud its potential, and multiply its problems. Most important, it is that this displacement has deprived the educational system of a whole host of alternative techniques and methods with which to reinforce general education and better meet the needs of all children.

If there is one thing that we have learned in recent years it is that today's students are career oriented and they look to the schools to provide them with the kind of education which will enable them to participate in and contribute to our work-directed society. Their motivation to learn depends heavily on convincing and continuing evidence that this is the kind of education they are receiving. And this is particularly true of the youngsters we have labeled "deprived" and who are considered grist for the general mill. The deprived are not the only ones who seek assurance that they are not wasting their time in school or who are emerging from today's educational system unprepared for productive life. If we are to meet our educational responsibilities to space-age kids, we can no longer tolerate an educational system that in a large part ignores the world of work where occupational studies are considered inferior to general studies and where youngsters in some kind of vocational track don't receive the academic training necessary for entry into post-secondary institutions. And, more importantly, those in the so-called college preparatory track are denied a vocational experience which relates their learning to reality.

Now, a first good step is to redefine vocational education, at least in part, as that aspect of an educational experience which helps a person discover, define, and refine his talents, and to use them in working toward a career. This definition sees vocational education embracing but not confined to the development of manipulative skills. It sees such skills used not merely to prepare for tasks but as alternatives and supplements to the verbal skills in the entire learning process. The definition requires, regardless of the educational level, an opportunity to learn and to demonstrate learning in non-verbal ways, learning the relationship between the educational program and the purpose of nature of work, developing a faculty for continuing growth, and the ability to work with, not merely alongside others.

Consider an elementary school pupil with reading difficulties. Now the conventional "Mickey Mouse" school system would supply him with another text, a special teacher, and an intensification of the abstract stimuli he's already having trouble with. A systematic integrated program, on the other hand, would use the concepts of vocational education and, as an alternative to another book, offer to let him work in a graphic arts laboratory with type and simple printing presses, where instead of reading a printed page of material he might be printing one. Youngsters having difficulties with numbers, for example, might work in a woodshop where they would perhaps develop their own materials, see numbers, and get a feel of measurement in an action setting.

At another level, consider the premise that universal higher education is just around the corner and it is at this point I have such difficulty in communicating with many of my colleagues and the whole system of vocational education. The trend toward a college education, and I'm using college in its broadest sense, has risen sharply in recent years, to a point where more than half have at least now entered some two- to four-year community college program generally. Observers are convinced that some fifteen years hence, schooling for everyone from three to twenty will have become the general pattern, and education beyond the high school a necessity for most of our people. Yet it is becoming increasingly apparent that colleges are not prepared to accommodate an influx of students who are strongly oriented toward specific career goals. Rejection and first-year attrition rates in post-secondary are ridiculously high. And a large proportion of youth, those labeled non-verbal, culturally deprived, or disadvantaged, are yearly lost to the productive process and to society. Yet, experience in industry training programs, the armed forces, and other settings outside the formal school system have shown that students who, under conventional practices, would have been deprived of a college education, succeeded when they were motivated by an occupational objective. This suggests that for many, preparation for work as well as work itself is not only a means of obtaining economic security but is an important means for the individual to develop himself to create a positive self-image. And we need to create in our elementary and secondary schools a coordinated curriculum where vocational and general education reinforce each other, where carefully designed programs prepare youth for advanced training in such new career fields as our rising medical technology, the graphic arts, in a host of para-professional occupations, and where students are taught general work skills which are transferable from one occupation to the other. Under such a system, no student would be rejected outright at any stage; though he might be directed, at least temporarily, toward a more modest objective, but within the same career pattern if his performance at any given point indicated a low probability of success in his present choice. When in the Sam Hill are we going to stop equating difficulty of subject matter with its importance? There would be no room in this system for arbitrary standards or for curriculum decisions based on convenience, expediency, or what it's usually based on — the sources of teachers. All students will be considered potential candidates for post-secondary education and training.

An effective occupational and vocational education program, then, would begin in the elementary school where youngsters would be introduced to the concept of choice between achievement through verbal or abstract performance and achievement through manipulation and demonstration with real objects. Both processes would be designed to achieve the same learning goals. Each unit of work in the language arts, for example, would begin with a self-directed experience in building something or in a simulated work setting, and youngsters with varying degrees of readiness would be provided with achievement goals to match. Eventually, all would have to verbalize or demonstrate what they have learned, at different times in different ways, and each in accord with his own particular God-given talent. Furthermore, we can no longer pretend that it is possible to do an effective mass educational job in a single classroom or from the viewpoint of a whole host of unrelated disciplines. Education really isn't a series of separate little containers of knowledge, though we tend to act as though they were and therefore set up more barriers to learning. A vocational objective could be the very vehicle to bring the containers of knowledge together to allow each student to see education in an action setting and to provide more flexible paths to its attainment. A prominent feature of elementary education would be a continuing discussion of how man uses work to support himself, how the major types of occupations use knowledge, and of the fact that not all productivity is necessarily verbal. No effort would be spared to develop appreciation and respect for the varying talents of individuals on the part of pupil as well as on the part of the school system. A major objective of elementary education would be to seek out the talent of each and show this talent in relation to the work world.

In the junior high and comprehensive high school teaching program, academic teachers would be teamed with vocational teachers representing laboratories, shops, and similar settings. They would arrange their teaching in a coordinated curriculum, each to reinforce the other and the subject matter. The comprehensive program would also provide a new kind of industrial arts course to be taken by all male students in the junior high school years. This would provide the basic manipulative skills needed in the high school program and the use of demonstration as an alternative to verbal performance.

Here's where I am going to get in trouble. Every time I propose this next piece I've gotten letters from the humanists of the world. Vocational guidance would be introduced early in the middle school years. A newly formulated guidance program would attempt to acquaint the student with the workings of industry and commerce, and to help him match his talents to a career objective. It would also include an annual career objective analysis for each student as diagnosed, discussed, predicted, and evaluated by the combined resources of man-made examinations, computer-oriented methodology, and man- and machine-derived interpretation. These individual employment plans, revised annually from the 7th grade on, would enable the student to understand the relevance of school, and his performance in it, to his own career development. He would know where the jobs are, the types of training available, the requirements for admission, and the demands that would have to be met. Such a device would go a long way toward reducing these 900,000 kids who drop out of school each year. Such a system would require a complete and continuing inventory of the composition of the work force, the employment market, a description of skills needed to function in each occupation, and a detailed definition of performance criteria in each. This, however, would be the simplest requirement to meet, given adequate resources—modern electronic data processing equipment, you know, already offers the methodologies. To implement the new vocational plan in full, community colleges and technical institutes would be available offering programs which articulate with, pick up from, and continue in advanced form experiences of at least the last two years of high school. Specific occupational training will lead either to an associate degree or to a certificate of achievement in a broad range of subjects. In addition, technical institutes would work with state colleges to provide avenues toward still further training and to assure that education is available to all, not only those with verbal abilities.

The young men and women who do not continue their education beyond high school (a declining number under this system) should be provided with a cooperative work-study program with private industry in the secondary years to prepare them for full-time employment upon graduation. The two-year community colleges have not been very successful in designing programs in occupational education which are well related to earlier training. There are, of course, notable exceptions, especially here in San Francisco, in Michigan, and in Florida. In general, though, the ability to articulate with secondary school curriculum depends on the college's organizational structure, and like it or not, the best results have been achieved when the college functions as part of a unified secondary system or the county system that has its own feeder program, than of the emerging statewide system of community colleges that too often identify with higher education in its wrong forms.

Well, the kind of educational system I have described has important implications for the relationship between vocational and higher education and the American Negro. It has become commonplace to observe that the United States is faced with a serious shortage of qualified manpower at the technician level in all professions. Meetings devoted to this problem in the past several years have produced an avalanche of materials and reports which dramatically illuminate the need for engineering, science, medicine, social science aids in a host of professional support personnel programs.

We've also inherited, unfortunately or not, the Booker T. Washington and W. E. DuBois debates on the strategies of economic and social development. And they have all seemed to emerge at the very time when both DuBois and Washington were correct and were wrong in terms of survival skills and social revolution. It's the same sort of paradox, I think, we find ourselves in in

Vietnam. We just walked into it. It's kind of a period. At the same time, there are vast numbers of socio-economically disadvantaged, especially Negroes, being served by educational programs unrelated to current occupational demands. Despite many, many warnings, very little has been done, very little has been done, in attacking the problem of status, income, occupation, and living conditions of the Negro, to provide more and better technical education beyond the high school. Rapid changes in technology, the explosion of knowledge, the problems caused by the separation of liberal and vocational education, have combined to create a mandate for the upgrading of courses which once had been trade, vocational, or technical, to the college level. Very few institutions which teach technical education or serve a predominately Negro student body, however, are dedicated to the policy of teaching students how to study independently — an essential for college level work. Furthermore, the faculties of almost all institutions of higher education, including most of those in the South which serve a Negro constituency, are committed to the view that the central purpose of higher education is to produce the liberally educated man and woman. And here lies the dilemma of higher education as the tool in the strategy for economic development for the Negro in America, because a liberal education is not enough. Very few would quarrel with the notion that a liberal education is essentially the same for all men at all times. But another concept of a good college education, preparation for a career, needs broadening. Liberal education is more than an education designed for a gentleman of leisure, for whom leisure is a career, and should in no way foreclose technical education. An educational program can, at one and the same time, at all levels, teach youngsters not only how to prepare for better lives, but also for better occupations. I question, I truly question, American liberal education in providing good people; the social chaos we face denies this entire premise. The intertwining of liberal and vocational elements in an educational program seeking to expand opportunity for a major portion of our population is both a necessity and a real possibility. In pursuing this purpose the two approaches need to be integrated throughout the entire educational experience. The current tendency to give a student, including at this institution, initial general education and then specialization is inappropriate on pedogogical grounds and is at the root of the major problems of curriculum development. Nor does it fit an educational philosophy which holds that culture and vocation cannot be separated. American colleges generally have begun to learn that a larger proportion of the population can profit from study at the college level than had been earlier assumed. The broader base expands considerably the number of young people who can go on to higher levels of education. The problem, however, is that this larger group contains persons of more diversified interests, and in many instances less secondary school achievement than had been previously acceptable. Some take the position that this means to accommodate the larger base is inevitably to lower the quality of higher education and to narrow the range of individual opportunity. Such an assumption is based and valid only upon a most naive and narrow definition of higher education and a rigid and simplistic view of its role and its process. It ignores the concepts of flexibility, alternate programs, and multi-level goals which are implicit throughout the system I have tried to describe. And if these are kept firmly in mind it becomes clear that further extension of educational opportunity both in terms of time and in terms of people threaten no loss in quality but instead multiplies and broadens the pathways to higher achievement. It offers promise of better lives and ultimately a better society in which quality of all kinds can flourish.

I want to thank you for this opportunity to try and spell out our particular system and the sorts of programs we have tried to support as you have developed them. If this system is to be integrated into an American educational system, it's going to come from you practitioners, and if you're going to wait for the general educational community to seek you out to ask for your processes, it will never happen. But I know you are going to deliver them because I know too many of you too well.

THE ROLE OF THE ADMINISTRATOR IN THE PRE-TECH PROGRAM

William Plutte, Richmond City Schools

COMMUNICATIONS: The interchange of ideas, opinions or information through speech, writing, signs, or devices. (Sender-Receiver)

The role of the administrator, as a member of a Pre-Technology teaching team, is to foster and encourage this concept in and among the disciplines in an interdisciplinary approach to education. (To go further, this is the purported aim of all education, but too often it becomes hopelessly mired in a morass of pedagogical inanities.)

The accepted image of a principal is one wherein he directs all supervision and control of the schools' educational program. In the Richmond Plan concept he must be willing to work as an equal partner on the teaching-planning team.

Before detailing the administrator's role let us go back to 1961 when ten classroom teachers, one counselor and one administrator met to take a long, hard look at our educational offerings.

Though special programs were offered at both ends of the academic spectrum, little was being done for the large percentage of students in the middle. College prep programs seemed adequate, many good industrial arts programs were in operation, and fine business courses were offered to capable students, primarily girls.

However, there was left a large number of students who fell short of our college or university prep standards, yet seemed to have the potential for more than "general" education which led to no preparation for vocations or higher education.

Research

After investigating community college offerings in terminal programs the group discovered we lacked a "third" track for a large number of high school students. This track would be one that would prepare the students for entrance into and completion of vocational programs at the community two-year college level.

Many programs were discussed but after consulting leaders in industry and technical institute personnel the group was impressed with the tremendous need, yet terrible shortage of technicians. Good technical institutes had devised programs that were alert and geared to the everchanging demands of automation. Their two problems were the lack of high school students seeking entrance to their institutions and the tremendous amount of make-up work that had to be performed by students before actually entering into a two-year track. Students generally were taking 2-1/2 to 3-1/2 years to receive an A.S. or A.A. degree.

Problem

A study of institute records indicated a general weakness in the communications, English, math, and science, with English being the major deficiency.

Through a year-and-a-half of preparatory groundwork, curricular guidelines were developed to show the relation of the disciplines to one another and to give immediate reasons for learning. Since the technician has to communicate the conceptualities of the engineer to the craftsman, the tech lab became the fourth discipline to emerge as part of the pre-engineering technology program.

Target Students

Through study of various student test scores, academic achievement, and potential indication, students were selected at the 10th grade.

The target student was one who fell in the range from average up to potentially successful college prep (50th to 85th percentile); who had good potential but had been underachieving.

Further, we needed evidence that he would be interested in a future as a technician.

Curricular Guidelines

The team, through discussions with institute personnel and industrial advisory personnel, came up with units that would best prepare the students, after their last two high school years, for a technological two-year program.

Paramount was the precept that the student was to know what he was expected to learn and why he was to learn. His learnings were not going to be left to chance. The reason for his learning a concept would result in his applying it as soon as possible to a practical situation. Through this method he would see the relationship of one discipline to another, or to all others.

The object of the program was—buy education because it was real, not to buy it on faith.

Evaluation

Though there was apparent increased academic improvement in the track, the real test of the program would be found in the successes of graduates.

Well over 80% of the graduates have gone on into some form of higher education, with the majority enrolling in Contra Costa community college. However, some graduates have gone directly to 4-year institutions, among which are, San Francisco State, San Jose State, Cal Poly, University of Pacific, University of California and University of San Francisco.

Stanford Research Institute is currently doing a year-long study of the pre-tech program and, more importantly, pre-tech graduates.

KRON-TV recently completed a documentary film based on the Richmond Plan. The film will give an overview on how the pre-engineering tech graduates have fared and how the original interdisciplinary concept has spread from the pioneering two schools to many other schools and to other educational areas.

At the end of the school year an evaluation team from SRI will publish a study, with findings and recommendations. What cannot be measured is the satisfaction and confidence gained by the students as a result of finally enjoying educational successes.

Summation

The administrator, as a member of the team, can encourage the total interdisciplinary project through:

- giving recognition to teachers and students and affording status to the program;
- exploring, with the teachers, all possible motivational factors;
- encourage experimentation;
- doing "leg work," in a supportive role, for field trips; getting visitors in public relations;
- setting up common conference periods for team members' meetings;
- constant evaluation of strengths and weaknesses of the program;
- insuring an atmosphere which will permit the dynamic features of the curriculum to take new shape as situations dictate; where constructive criticism is not only accepted, but sought; where teachers feel personal concern for all students' successes or failures.

The Richmond Plan approach is successful in relation to the interest, desire, and dedication of the total teaching and planning team.

THE ROLE OF THE HIGH SCHOOL PRINCIPAL

A. Winston Richards, Pacific High School

Developing A Climate For Innovation

Recently, much has been written concerning the changing role of the high school principal. The theme seems to reflect a new emphasis upon leadership — instructional leadership versus housekeeping. To be sure, this theme has many variations including: new responsibilities in the field of staff relationships, the implementation of national curriculums (principally in the sciences), development of more meaningful education for the disadvantaged, and a reassessment of certain educational programs to determine their viability in this, the mid-twentieth century. It is this last responsibility on which I should like to focus.

It is my conviction that much of our current education was sadly out of date twenty years ago. Today, the gap borders on the fantastic. And let us not disillusion ourselves that a high school principal can improve the situation when he works in isolation. He must have working partners, and these may be found among the faculty, provided that dissatisfaction with the status quo has been created. This may sound like a dangerous course to pursue, but when properly controlled and logically channeled, such an atmosphere can lead to high purpose which produces a rare product best described as uncommon achievement.

A good starting point may be the development of a philosophy which has as its central concept that the purpose of education is to meet the needs of all students. This may sound trite to many of you, but when the needs of students are factually assessed and measured against the educational offerings of most high schools, the shortcomings revealed are so serious that the natural inclination is to sweep the whole mess under the rug for another decade. However, time is running out and secondary education's big stall will no longer be tolerated by many communities; perhaps not even by the nation itself.

The assessment to which I have referred leads one to debunk the myth of the comprehensive high school. This American dream, as magnificent as it was, has not kept its promise to the people. Most high schools are comprehensive only in name, and fall far short of providing programs suitable to the interests and abilities of all students who are enrolled. We need to examine the actual alternatives available to our students in comprehensive high schools to become fully aware of this situation. I submit that these alternatives are so limited in number that the examination can be conducted within a very short period of time, and with the simplest of research techniques.

If, then, we are to modify the comprehensive high school in order that it may live up to its name, it becomes necessary to study the student body. The patterns of success and failure, the nature of the home environments, together with the level of parent and student aspirations must be thoroughly assessed. In addition, we need to know a great deal more about what happens to our students after graduation. How many actually go to four-year colleges, and of those, how many graduate? We should also know how many of our students go to junior college and how they distribute themselves among the various available curriculums. An interesting sidelight would be to discover how many enroll in junior college not as a primary choice but because they are unable to find employment.

Other useful information would include enrollments at technical, trade, and business schools, together with data concerning the records of those students in attendance. Of equal importance is data concerning those who enter (or try to enter) the labor market after high school graduation. How many are able to find employment? What kinds of jobs are open to them? Are they able to pass apprenticeship examinations? Is employment steady, or are they dismissed for lack of skills and attitudes, which the high school should have helped them develop?

The investigation which I have briefly outlined constitutes a major undertaking and I do not apologize for that. How else can we determine the quality level of high school education? Upon what other basis or bases can we justify curriculum change, requests for additional financing, or even our very existence? Coupled with this reassessment of the product we are graduating is the necessity to be aware of the technological explosion which has taken place in the last decade or two. The new technology with which we as adults are just beginning to learn to live (remember the furor over the telephone change to all digit dialing?) has brought with it a whole new set of demands in terms of required skills, competencies, and attitudes on the part of members of the labor force. We know that most people will be retrained three or four times for new positions during their working lifetimes. Many of these positions do not now exist even by title. This situation poses the question: Have we equipped our graduates with the necessary tools to accept and profit by such retraining, or have we given them a set of obsolete skills which will not stand the test of time, thus eventually leaving them on the scrap heap of welfare recipients?

Up to this point we have involved the principal and the staff in a searching reappraisal, the results of which clearly indicate the desirability of change. Many of you have already asked yourselves, will the parents in my community support those changes indicated as desirable by our studies; My answer to that is yes, provided that: parent leaders are involved as partners early in the program; they are not shielded from unpleasantness; their counsel falls on receptive ears; and they are given reason to believe they have a legitimate role to play in the decision-making process. Parents are no different from faculty in this respect — they accept and work for change when they are involved to the point that they feel concern.

Finally, we should not be misled by the notion that change must always carry a price tag which is prohibitive, in terms of dollars. This again can easily become a rationale for the "do nothing" syndrome. It is a certainty that some educational programs are more costly than others. But with the help of foundations (which have been rather generous with seed money), the increasing availability of federal funds, and the magnificent community support which *can* be rallied to the aid of defensible educational innovation, even the more costly programs may be feasible.

Planning Innovative Programs

After the assessment we have talked about has been completed, you, the principal, and your staff, may want to look at two current technologically oriented programs, namely, Pre-Tech Engineering and FEAST. As you consider these curriculums, remember that *the most important element common to both is the interdisciplinary approach*. This is the underlying concept, and I submit that it is applicable to a wide variety of educational programs. Perhaps the most important challenge is to utilize this concept in new and different curriculums, i.e., other than those already tested. Some of the programs or curriculums which are amenable to the interdisciplinary approach may actually be existing offerings which are reworked and revitalized through use of the interdisciplinary team teaching technique. Others may be additions to the curriculum designed to meet the needs of a specific target population within a given student body.

A careful assessment of the teaching staff is also an important factor in program selection. Teaching teams should be chosen with care from among volunteers. To require a teacher to enter into an innovative program is to invite disaster, for the level of enthusiasm and the degree of dedication required to make a success of such pioneering ventures requires a good deal of effort on the part of each person involved. It is also true that teaching teams need leadership from within the team, yet they cannot easily survive when composed entirely of prima donnas. The principal must realize the dimensions of the task facing each team member, and accurately assess the role each is to play.

To more readily understand the many adjustments which a teacher must make, let us briefly examine the situation which faces a typical English teacher who has volunteered to become part of a Pre-Tech team. First of all, the teacher must develop a basic understanding of what each of the other team members is doing in his respective area. These areas typically include physics, chemistry, mathematics, shop laboratory, and electronics, as a minimum. Our English teacher will also have to learn the terminology appropriate to each of these areas, in order that the written work of the students can be examined for accuracy. Another factor which may be disconcerting is that many of the old familiar teaching materials, such as the Greek myths, must be abandoned in favor of new materials which cannot be found in textbooks, but must be developed as the need arises. This will involve selecting worthwhile literature which makes a contribution to the major goals of the new program. A further adjustment involves the acceptance of descriptions of projects in place of the usual theme. Finally, our teacher must learn to innovate in terms of teaching technique beyond his wildest imagination. For example, can you imagine an English teacher bringing a tape recorder to class, permitting students to learn its operation on a hit-or-miss basis, with the eventual goal in mind that each student will write a manual of operation for this machine? A further shock is in store when we suggest that evaluation should be based on how well other students, totally unfamiliar with the machine, can operate this piece of equipment by following the student-prepared manual of operation. But doesn't this sound realistic?

So we must ask ourselves, "Which willing faculty members can and actually will do the job?"

Implementing The Program

Now that the program has been selected and the faculty is ready to move, don't expect them to jump on the bandwagon, do all the work, and accept the inevitable risks which change and innovation incur, while you bask in glory from a detached position. The principal now must encourage, expedite, assist, and support. Faculty members should be free to try any new approach. The only appropriate admonition is, "Stop it if it doesn't work and try something different!"

It is important to avoid the temptation to transplant a program from another school. Your teaching team should write their own program to fit the situation in which it will be taught. This creates a new need, namely, in-service training. Most likely your teachers will write their curriculum during the summer. This should be accomplished not as individuals working in isolation from one another, but as a team effort. It is important that summer workshops to upgrade their skills and enrich their backgrounds be provided if there is need.

But don't be misled by the notion that when summer is over and school begins, their need to work and confer together has been satisfied. The process of discussing, coordinating, and correlating their materials, presentations, and approaches is the heart of the interdisciplinary approach, and without it degeneration will soon set in and the golden thread of the process will snap. So, what does the principal do to avoid this pitfall? The answer is relatively simple: Provide a common conference period for team members!

Up to this point we have created the climate for change in the school, assembled an excited team of teachers, selected the program, provided in-service training leading to a developed curriculum and we are ready to go, except for one thing — the students. Normally, the decision to launch a new program, or revamp an old one, would have been heralded in the community through the press, P.T.A. meetings, and other channels. This is good, for it prepares parents and perhaps some students, but a word of caution is needed. Your enthusiasm may lead to overselling and this can be just as bad as underselling. Prospective students and their parents need the facts and an intelligent recommendation from a qualified counselor — period.

Now for some follow-up activities. Our experience has indicated that there are a few things which a principal can do or cause to be done which will tend to avoid problems and create a climate for further innovation and experimentation. The first of these is to orient the general faculty concerning any new program which is to be placed in operation and then to follow-up with progress reports from time to time. The teachers who are involved in innovative programs need and deserve the understanding and support of their colleagues. It is the principal's job to secure this for the teaching team.

In many of these programs it is important to find opportunities within the school for students to demonstrate their skills, to gain esteem of the student body, and to develop self-confidence. I say this because, for the most part, these curriculums have been developed, not for the typical college-bound student, but for those with other aspirations. High morale can be developed among the students in these programs as a result of efforts on the part of everyone to give them their place in the sun. This will make the task of teaching easier, and again build the climate for further experimentation within the school.

It has been our experience in both the FEAST and Pre-Tech Programs that excellent results are obtained when a vocational counselor becomes a participating team member. It is a fact that the students involved in these programs need a good deal of guidance. The involvement of a counselor who becomes a specialist in these areas will be of considerable benefit to the students and teachers involved.

Finally, as the program develops from infancy to maturity the principal and his staff should continue the search for new ways to employ these same instructional principles, concepts, and techniques, in order that more and more students may enjoy the benefits of truly meaningful education.

THE TEACHER'S ROLE IN THE PRE-TECH PROGRAM

Robert Dycus, Harry Ells High School

The fine art of curriculum writing is in a state of flux. Many years ago the curriculum was written by experts—subject matter specialists who wrote down what was to be learned and handed it down to teachers. In more recent times teachers have become involved in the writing of curriculum. The theory was that master teachers would utilize their education and years of experience and come up with a course of study which would guide and assist all teachers.

I first taught in Richmond in 1951—16 short years ago. Social studies teachers in Richmond had compiled a course of study in 1948-49. It was a magnificent tome of 200 plus pages—complete with unit plans, detailed lists of objectives, activities, bibliographies, even suggested assignments and questions —but it helped me not. I used it 2 or 3 times in 10 years—and I think I used it more than most teachers.

In the middle '50s, I helped write courses of study for several grade levels. They were very helpful to me and I found a few teachers in the district who felt the same way. However, most teachers filed and forgot them.

One idea which we believe is valid—one that has come to us with some travail—the curriculum is not a paper product. It is not static—in fact, we suspect that you kill a program when you put it on paper. The curriculum is learning—it is what takes place—a happening. This is not to say that planning is unnecessary—the pre-tech teachers know that they must constantly write and rewrite the program. The process in teaching is all just as the process in learning is all. Earlier ideas of writing curriculum were defective because they aimed at a product. Pre-tech planning emphasizes process. We know that if we use last year's lesson plans, we are at least one year behind the times.

A second point—if teachers have no time to think and plan, change will either be glacierally slow or non-existent. In the early days of pre-tech we were very fortunate to have foundation grants which provided us with time.

The next point is best illustrated by a story. I heard this story when I was much younger and I believe it. Today, I still tell it because there is truth in it, even if it is apocryphal. A guzzled old veteran had taught Algebra I in a San Francisco high school for 25 years. After some administrative shifts his school came up with a hustling young principal who was eager to improve education. This principal felt that it was too easy to stay in a rut. He called in the veteran and told him he would be teaching sophomore orientation next year. The old teacher looked at him quietly, studied the floor for a while, then looked his principal in the eye and said, "You can call it sophomore orientation, but I'm going to be teaching Algebra I." Teachers must volunteer to teach in the pre-tech program. It requires a great deal of interest on the part of the teacher as well as a willingness to work above and beyond the call of duty. A teacher who is assigned to a new program against his will ends up teaching Algebra I.

A fourth thing we have learned about the role of the teacher is that the teachers must supervise and support each other. We have a modified team-teaching situation at Harry Ells High School. We supplement each other's efforts. For instance, the vocabulary for physics and mathematics is studied and learned in English. We reinforce each other. If we find that the students didn't learn after a particular unit, we make another attempt from another angle—or another class. Teachers at Ells in the pre-tech program evaluate each other's performance. This is evaluation as it should be. The common goal of all pre-tech teachers is to help the students learn and evaluation of students and teachers is the only way to discover how well we are doing.

A spin-off of our pre-tech program is the unintended in-service education of teachers. Usually high school teachers talk with their students and other teachers in their department. Few teachers know or care what the teacher next door is doing if he is from another department. Most high school education is compartmentalized—not only water-tight—but idea-tight. Pre-tech teachers widen their knowledge by crossing over subject area lines. An English teacher must learn something about a lathe if he has asked his students to write technical instructions for setting up a lathe. Pre-tech students are motivated when they see that their teachers are interested in all of their subjects.

We have found that teachers must control this program. The Hawthorne effect works for both students and teachers. The success or failure of the pre-tech program is dependent upon the involvement of both students and teachers. If it is just the principal's program, or just the teacher's program, it will not succeed. We have no monetary compensation for teachers; yet there are rewards. Most teachers feel rewarded when they are engaged in a worthwhile project. They enjoy seeing young men resume learning.

What, then, have we learned about the teacher's role in education? The teacher must be the catalyst. The university cannot change teaching-learning;

school administrators cannot, the legislature cannot. If the quality of education is to be improved and if education is to catch up with the modern world, teachers must be agents of change. They will need time—provided by Tech Center, foundations, school boards.

They will need help—consultants, professors, advisory councils.

They will need ideas.

They will need processes.

We have learned that the teacher's role is the most important one in the process of change. Without his cooperation and zeal, we can do nothing. We have the process for change and the agent of change. We need now to put them together and provide time. We can use the pre-tech experience to improve education.

THE RICHMOND PLAN — A CONCEPT OF TEACHER RE-EDUCATION

John C. Briscoe, Monterey Peninsula College

I shall develop two of the major aspects of the Richmond Plan re-educative process, without which there would be no application of the Richmond Plan, and there would be little chance of success, whatever the undertaking.

What I will present first is the pre-service phase of teacher/administrator orientation. Second, the in-service phase which will deal with the adaptation of techniques and content. Third, I will touch briefly upon the interdisciplinary concept and what we first believed about it.

I think the best way to begin is with a definition of the key phrase of the Richmond Plan concept - articulated instruction. This term has many meanings, but it is basically a system that organizes independent teaching functions into integrated patterns of total meaning. The term "Richmond Plan" connotes an approach to instruction that combines the several "solid" subject matter areas into an articulated, motivational, instructional program.

At the heart of any new undertaking should be a plan, and, as the term Richmond Plan implies, there can be no such program where there is no plan. It is on this very topic that an in-service director encounters his first solid resistance by the teachers. There seems to be an almost universal rejection today of preparing a plan of attack. To suggest lesson plans in some places is cause for being branded unprofessional. The argument against such activity by teachers seems to come from a fear that preparing such material means "lock-step" instruction, and is therefore to be avoided at all costs, even if it supports no instruction at all. It is my conviction that this attitude ignores the nature of learning groups (group differences) and is antagonistic to imparting information of a "how-to-do-it" nature.

It is precisely because this attitude can be expected that my lesson plans for teacher training programs have been divided into two sections: Pre-Service orientation and In-Service preparation. In the Pre-Service phase, the participants are given all the examples, recorded data, and purposes for an articulated instructional program. This phase also includes administrators, in some cases board members, and resource people who have undergone the experiences related to a Richmond Plan type program. In the In-Service phase, participants work as teams and undergo the rigors of venturing across subject-matter bounds to prepare their plan.

Pre-Service

What we try to accomplish in the Pre-Service is to imbue the teachers and administrators with the attitude that their biggest chore is to draft their plan. What we put over in the in-service phase is how to develop a plan and why it is essential.

The outcome of Pre-Service is the formation of a willing team of teachers and administrators from one school. The question then is, "What constitutes a willing team?" It is a group of teachers who can and are willing to work across traditional classroom barriers. A willing team has two distinct objectives: 1) to discover and develop logical crossover points for learners from one subject to the others, and 2) to learn all they can about their learner group, its identity, needs, potential, and aspirations. I make a point of this phase, and the two objectives, because not all teachers and administrators have the desire or capabilities to undertake an interdisciplinary project. It is the matter of bringing together those individuals on a faculty who are willing and will undertake a program that underlies the need for Pre-Service.

Though teams are formed through Pre-Service, this by no means implies that the task ends here. In fact, it is only the beginning for the team and the in-service director. There is the matter of preparing instructional materials that fit into the plan. There is the on-going problem of nurturing the plan during a long period of trial. The most important thing that Pre-Service must achieve is to put teachers together solidly enough to reduce the threat that institutional change will impose upon them as individuals. The greatest cross that a team will bear is that imposed upon them by their "colleagues" who will not, or cannot, accept the notion that interdisciplinary team teaching is a more effective method than the traditional single subject, single classroom, single teacher approach. During the pre-service phase, as many key people as possible should be involved, for unless there is institutional support, the proposed change will become a "storm center" of ideological conflict within the institution. Or, on the other hand, it will die of apathy and disinterest. There are enough instances right here in this area where failure has followed on the heels of trying to impose a program upon a school without first orienting the people properly. If we have learned nothing else, we can now say with absolute authority that Pre-Service orientation is mandatory if failure is to be averted. It took those of us who pioneered the Richmond Plan two years to get off the ground.

Resistance to change is to be expected at any level or stage of development. In fact, unless there is resistance, it is doubtful that institutional change can endure, or that individual change can go very deep. Pre-Service needs to be aimed at all levels of the institution, not just the teachers. Frequently one hears the comment that "We have been doing this same thing for fifty years." Yet, when one has a good look into the institution he is hard put to discover where. To me, this is just another cloak to disguise resistance to change, and it is a good indication that a serious Pre-Service program needs to be administered.

A Richmond Plan program can be engineered to work in almost any school as long as it has the advantage of an administration that encourages and is instrumental in providing a working environment. Where the administrators are fearful, or consider themselves as the innovators, or are dogmatic, a program is in trouble from the outset.

In-Service

What are we concerned with in the Richmond Plan type program? Fundamentally, learners, learning materials, and equipment put together in such a way as to yield the greatest educational profit. In such an enterprise, we are committed to make our efforts pay in both short-term and long-term operations. In the in-service progress, it needs to be stated and restated that most instruction is based solely on "long-range" goals. This is one of the major reasons for high learner attrition in so many schools. It is in the area of short-term operations that most variables exist which affect learner success.

The objective of in-service training is the development of a plan. The task of the in-service director is to accurately convey the meaning of, and need for, a plan. Definitions are paramount in the early stages of in-service. The definitions that I employ are as follows:

Planning - Fundamentally setting down choices between alternatives. The plan is to allow for making things happen that would not occur without organization.

Enterprise - An undertaking based upon specific objectives (in the Richmond Plan Pre-Tech type programs, specific objectives of operational behavior as well as knowledge). Enterprise also requires policies which govern the whole program. Policies such as pupil selection, scheduling of classes, use of facilities, etc. Enterprise further involves procedures. Procedures for instruction, procedures for evaluation, procedures for communication, and procedures for equipment purchase and use.

Teaching - The teaching function (which to many persons in the business, is non-essential — and in some schools that may be true) is that of experience (or expertise) directed toward educating the inexperienced or undisciplined. Planning provides for the most skillful use of teacher manpower by capitalizing upon their skills. Teaching is enhanced by "appropriate equipment," and enterprise equips the team with a built-in lien on otherwise private stocks and domains.

Through in-service, one learns that even a bad plan is superior to no plan. Looking ahead is the essence of all good management. In-service is taking time out to look ahead and plan.

What should a plan achieve? What is the scope of a good plan? Number one on the list of what a plan must achieve is, it must implement established goals. Two, it must allow us to detect deviations as they occur. Three, a good plan also makes provisions for changes when it is necessary to make mid-course corrections.

This aspect of corrective steps is one of great importance, because of an almost universal tendency on the part of curriculum outline devotees and course writers to make their works eternal. Curriculum experts are not usually found in the real world of teachers and learners — they are more often in "fairyland." Teachers must draft their own curriculum guides, be responsible for their effectiveness, and keep them vital. The only way to assure the vitality of a curriculum plan is to build into it the mechanism for change. How often have you heard how this plan or that was a failure, en toto, without anyone really knowing why. The reason is usually quite simple: the plan was a statement of broad scope, long-run objectives, and gave no thought to revising internal structure and quick turnaround.

Most plans departmentalize and/or specialize. The richness of the Richmond Plan approach is that by forming interdisciplinary alliances, attention has to be focused upon short-term operations within a broad framework. Such structure allows for maximum control over a program by the practitioners. Again, to departmentalize and specialize reduces control. No single person should ever be in a position where he can make or break a program. In-service has to get this point across with great clarity. A good plan will provide for continuity and ongoing operation, regardless of personnel, the realities of the teaching situation, and any of the other natural hazards which a program faces.

The Adaptation of Techniques and Content

No other phase of the Richmond Plan is so rewarding as that of the participants working together as an interdisciplinary team for the first time. They have wrestled with new ideas, been berated (usually indirectly) for the faults of single-discipline shortcomings, and have come through with at least a little willingness to give it a try. If they had wanted out, this is the point of no return. I have yet to see one person want to dismiss himself after working with his teammates.

The kinds of questions with which the in-service director is faced, from this point on, are very specific. For example, when drafting our plan, how specific shall we be? How much detail is required? The ideal plan, which is what one should strive for, has five parts.

1. There needs to be a process plan. This will include instructional guidelines, time allowances, lead-time for evaluation, and reruns.

2. An instructional content plan. Here each subject specialist has the task of delegating parts of his subject matter to other teachers on the team. The aim is to achieve maximum articulation between the subuects. The need is for reinforcement of learning through application.

3. A special equipment and services plan that specifies space needs, equipment requirements, and special skills (available from the team, within the school, or from an outside source).

4. A pupil selection and cumulative information plan which is a good indicator of learner problems, interests, potential, achievement, and selection criteria.

5. A milestone chart that records the flow of learning experiences, means for implementation, and over-all control of the master plan.

Now, the question which has to be dealt with is, "How does one know what to include prior to teaching the students?" and "Why go to all the trouble of working up a course of study plan only to have it prove inadequate?" In the in-service phase, realistically, all one has time for is to get a pattern for course development over to the participants. To expect a fully implemented course of study from a four-week workshop is faulty thinking. However, the questions need to be answered if the Richmond Plan Concept is to be put into operation. There are two types of "Ideal Plan." One is based pretty much on estimated needs with some basis in comparison; and the other based upon experience and data gleaned from a year of practice. The first type of plan is what a team of neophytes will draft. It will have a synthetic basis, to be sure. But a synthetic basis made up of arrived-at conclusions and speculations by the team. It is the "constitution" of the new team. Without it, there is no real pact to hold the team together.

After a year of experience, the team will have gained insights and know-how that will enable them to revise their original plan and improve it. The beauty of this process is that the people who worked on the original problem, working out procedures and goals, now come together to refine their program and make it work even better. This relationship of the members of a team is often overlooked, by both teachers and administrators, and people in status positions are tempted into authoritarian statements regarding the solution of in-service problems.

The Richmond Plan insists that participants have as many opportunities as possible to relate themselves to each other. The in-service activities must aid the participants significantly in changing from single-mindedness in their approach, to a workable interdisciplinary approach.

One final word about Richmond Plan In-Service. It is a process of teacher Re-Education — the goal is learning, change, improvement. Someone has to learn something if the activities are to be effective. This means that guidelines for planning, organizing, and conducting in-service programs be based upon sound interdisciplinary teaching principles.

EVALUATING THE TECHNOLOGY PROGRAMS

Harry V. Kincaid, Stanford Research Institute

The purpose of the project is to understand the Pre-Technical program, its major goals, and to develop criteria by which to estimate its effectiveness. The project is supported by a grant from the U.S. Office of Education under the provisions of the Vocational Education Act of 1963. I should like to emphasize that the project is conceived as an applied research task. We hope to develop information and conclusions useful in a very practical way to school people in viewing the Pre-Technical concept in particular, and, hopefully, in viewing educational change in general.

Five specific project objectives are guiding our study:

1. To describe and analyze the critical events and processes leading to the decision to introduce the Pre-Technical program in Bay Area secondary schools where it now exists.

2. To develop, on the basis of the above analyses, guidelines useful to other school systems in introducing the Pre-Technical program concept.

3. To collect and analyze existing data bearing on the effectiveness of the program as reflected in the behavior of participating students and faculty and the effects on other programs within the sponsoring school system.

4. From the analyses to develop a set of preliminary conclusions concerning the outcome of the Pre-Technical Program, and of the Pre-Technical concept in general.

5. To develop a programatic design for continuing, long-term evaluation of the Pre-Technical program concept.

Our study is being conducted in two phases. The first phase is designed to explore the program in depth in a relatively small school system. We chose to conduct this preliminary work in the Richmond Unified School District. Richmond is, as you know, prominent in the development of the Pre-Technical approach. The Richmond District has four high schools—Richmond, El Cerrito, De Anza, and Harry Ells—the latter two were particularly active in the early stages of Pre-Technical experimentation. The primary purpose of Phase I is to develop the specific procedures for the larger Phase II effort. In Phase II we will broaden our scope to include about eight more high schools using the Pre-Technical program. I should mention that we are now in the early stages of Phase I. Therefore, all of our comments must be regarded as provisional and subject to change.

Our work to date includes the following activities:

1. Background work on the Pre-Technical program and related educational experiments in secondary schools.

2. Conversations and interviews with authorities in the field of education and curriculum change.

3. Interviews with students, teachers, and school staff actively involved in Pre-Technical programs.

4. Observation of Pre-Technical and other classes.

5. Intensive investigation into the availability and reliability of existing statistical information on students and graduates of the Pre-Technical program.

6. Development of measuring instruments and methodological strategies for use in Phase II of the project.

Since we are in the very early stages of the project we have no conclusions concerning the outcome of the Pre-Technical programs in Richmond. However, we would like to share with you some of our emerging ideas and hunches.

First, we have spent a significant portion of our time thus far in trying to arrive at a reasonable statement of the goals of the Pre-Technical approach. This is difficult because each expert one talks to has a somewhat different statement of goals from other experts. Most would agree, I think, that the broad purpose of the Pre-Technical program is to provide an alternative curriculum for a large number of students of average capability who are not achieving up to their potential. Behind this purpose is the hope that the student will continue his education at a two-year school of some kind with the aim of achieving a successful adjustment in a technologically complex society.

As you know, the means by which this end is to be achieved is through careful selection of students and faculty. The Pre-Technical faculty is supposed to be a cooperative team of teachers of math, science, English, and tech lab. Through correlating academic and theoretical subjects with the tech lab, and through articulation of courses, they hope to renew the students' interest in education.

Second, we have found, predictably enough, that our early impressions of the Pre-Technical program have altered drastically as we proceeded with our work. Observation of Pre-Technical classes in particular, over a fairly long period of time, has been most valuable in tempering our first and rather gross impressions of what was going on. It appears that there are aspects to innovations such as Pre-Tech that can only be comprehended through extensive first-hand acquaintance with the people involved—most importantly, the teachers and students.

Finally, I should like to share with you some of our hunches concerning the Pre-Technical program.

1. Teacher enthusiasm and commitment is an important aspect of the program. We are not sure it is critical. There may be tangible results from the interdisciplinary approach quite apart from teacher enthusiasm.

2. Selection of teachers already possessing desired characteristics is probably the easiest way of insuring effective Pre-Technical teaching.

3. In-service training for teachers appears to be of critical importance.

4. Teacher interaction is essential to a strong Pre-Technical program.

5. Time for regular team meetings is important to successful teaching interaction.

6. Pre-Technical programs are most successful where teachers volunteer for Pre-Tech.

7. A genuine understanding of other disciplines involved is critical for effective interdisciplinary teaching.

8. Maximum flexibility in adapting and adjusting teaching methods and timing to coordinate with other disciplines is critical in interdisciplinary teaching.

9. Freedom from defensiveness regarding lack of knowledge in other team disciplines is desirable.

10. The degree of administrative support may determine the degree of success or failure of a program. Passive resistance by an administrator may in some cases be overcome by committed teachers.

11. Administrative resistance probably springs in large part from problems of scheduling; in schools with more than one interdisciplinary program, scheduling problems may be most complex. Resisting administrators also feel concern for the problems of the overall school population and resist giving special attention to one small segment such as Pre-Tech.

12. The student selection process is most complex. We have found that great care is exercised by considering the entire student profile: subject marks, test battery results, aptitudes, interests, behavior. Beyond these criteria, an undefinable "hunch" may determine student selection.

13. The fact that Pre-Tech boys volunteer for the program does not necessarily indicate an interest in technician-type training; in some cases it may indicate an admission of failure in college prep and a sincere wish to achieve, or an easier route to get through high school with passing grades. It may even be seen as the only route to make up math and subsequently become eligible for college.

14. Pre-Tech students tend to be boys who have not developed oral communication skills because of previous classroom failures. In college prep classrooms they may have become withdrawn in the presence of brighter, more communicative students.

15. Pre-Tech students (in a good program) tend to develop confidence in oral expression through classroom participation in a familiar group in which they feel secure.

16. Student interest in learning may be reactivated or instilled for the first time through the program's interdisciplinary and practical application approach to education.

17. If no other benefits can be ascribed to Pre-Tech, at the very least it appears Pre-Tech students tend to take more solid subjects (math, physics, chemistry) than they would have taken had they not been in Pre-Tech.

18. It would be a mistake to evaluate the program solely on the basis of how many technicians it produced; one of the program's salient features is its lack of specificity in occupation orientation. It appears to be providing a broad skill base for further training in a technological society.

PROJECT FEAST
(Foods Education and Service Training)

Hilda Watson Gifford, San Francisco State College

What is Project FEAST? FEAST offers interested and qualified high school students in the 11th and 12th grades an opportunity first to explore and then to prepare for a career in your industry, food service and hospitality.

What is taught? Using the team teaching approach, students learn the fundamentals of commercial food preparation and service. This is coordinated with mathematics, science, and English courses, and incorporated into a regular high school curriculum.

How is industry involved? Each school has an active advisory committee from management and labor. Their guidance is assurance that the program meets the needs of the industry. Industry leaders strengthen the program by making tours and speakers available.

What kind of employees can industry expect? Interested, alert young people who listen, follow instructions, take pride in a respected and growing profession. Their skills and background permit them to obtain entry level jobs and stimulate them to continue training and learning through apprentice and on-the-job programs as well as American Hotel and Motel Association and National Restaurant Association short courses. Qualified graduates are counseled to continue their education in a junior college or university, specializing in food service.

The program was funded in 1964 by a Ford Foundation grant, administered by the Hotel and Motel Foundation of the City College of San Francisco. It was funded by the Vocational Education Act of 1963 through the California State Department of Education, Vocational Education Section, Bureau of Homemaking, in cooperation with the local districts and The Ford Foundation. FEAST has been sponsored since 1966 by the San Francisco State College Center for Technological Education.

Historical Background

It was suggested that we give you a bit of the history of the program—how it developed. It was a pilot program and funded in 1964 by a two-year grant to the Hotel and Restaurant Foundation of the City College of San Francisco from The Ford Foundation. The program for the Hospitality and Service Industry was an experiment to test the very successful Richmond Plan for Pre-Technology programs. The Ford Foundation wanted to know how this approach would work for another industry or cluster of occupations.

Two schools—Pacific High School in San Leandro and Oakland Technical High School in Oakland—opened their programs in the fall of 1964, funded by the Vocational Education Act, as we mentioned. The FEAST program profited by use of the Pre-Technology concepts. Additional techniques were implemented. First, a strong industry-labor advisory committee was formed prior to the opening of any program. Second, the national and local Hotel and Restaurant associations as well as the Culinary and Service Workers unions were contacted and the program potential discussed with them. Third, the objectives and the general education pattern were discussed with the Council on Hotel and Restaurant Education, the California State Department of Education, and the U. S. Department of Labor, Manpower Research and Training. Now, that sounds rather formidable. Actually, it was very easily and quickly done. We wanted to be sure—was there a need? Would we be assured of an industry-education partnership in this? You see, we prefer to pick a winner before we enter the race.

Fourth, and very important to a program for these industries, a different kind of teacher training workshop. A working workshop was organized for the team members. At this workshop, every team member, including the foods teacher, the counselor, the English and mathematics teachers, the cafeteria manager, and, in some instances, we were delighted to have the supervisor of cafeterias from the districts attend these workshops. They were involved in the actual cooking. During the first workshop, one of the counselors was amazed—he came to work, checked in at a time clock, requisitioned a uniform that included a chef's coat, apron, and hat, and reported to the chef in the kitchen to peel potatoes to serve 75 people at noon! This had not entered any of their minds. After the first shock they enjoyed it very much and they saw why. We were not teaching them to peel potatoes, but we were teaching them the application of the purchase and production of a product for a restaurant—to personnel, to mathematics, to English, and to food production. The reason we peel the potatoes is that this is a starting point for all these teachers to learn some of the problems their students are going to face when they take a job. Second and more important, if you are in the business you figure out when it is profitable to buy processed potatoes, dehydrated potatoes, potatoes by the 100-pound sack and peel them with a peeling machine, when it is profitable to use the convenience food potatoes. There is a place for every one of them in the feeding industry and there is a time of the year for everyone of them. This becomes a mathematical problem, then an English problem, as the English teacher explains this or as the supervisor in the kitchen explains it to his personnel. This is the sort of thing this workshop is supposed to help the teachers with. Workshop participants feed 75-100 people daily for the two-week period. This actually is a capsule presentation of the Hotel and Restaurant Department's program at City College of San Francisco.

The objective of this type of workshop is to introduce the team members to the wide world of the occupational opportunities. Have you ever thought about how many occupational opportunities there are in the hotel and service industries? Don't you find yourself just thinking cooks and bakers and waiters, maybe bellmen, perhaps a room clerk? Did you ever think about engineers, maintenance people, CPAs, interior decorators, lawyers, doctors, nurses, upholsterers, cabinetmakers—I could go on and on. This is the sort of thing these people learn. They learn the problems of the industry and the rewards and how their own subject matter applies.

We have a sheet available that our staff developed explaining what the FEAST workshop is. This two-week laboratory workshop is followed by a two-week course outline and program development. It is most important that in a program of this kind teachers develop their own course outlines. They know their subjects and they apply their subject matter in a manner that will mean the most to the students and will prepare the student for his occupation. It is never watered down—if anything, it is strengthened. To do this, they have had the experience of the two-week workshop and they are given large packets of reference material. Guidance is also available to them.

In September, 1964, school opened—two programs, 42 students enrolled. In 1965, three additional schools applied for VEA funds and enrolled in workshops. With the 1965 workshop, San Francisco State College offered three units of credit for all FEAST workshop participants. By that fall, the student enrollment grew to 153. With the fall of 1966, ten school teaching teams had completed one or two workshops and approximately 350 students were enrolled. At that time, the Center for Technological Education of San Francisco State College puts its umbrella over FEAST. This has been a fine association.

There are, of course, many problems in FEAST, but in my 45 years of experience in the industry and in education, I have not found anything worth doing that did not have problems. I don't think this frightens any of us who are interested in the future of the young people of America and our favorite industry, whether education or the hospitality industry.

IMPLICATIONS FOR JUNIOR COLLEGE PROGRAMS

Louis Batmale, City College of San Francisco

We have had a fine array of speakers on the Pre-Technology program at the high school level. My particular responsibility is to talk about its implications from the junior college point of view. I would like to speak from experience, because I do work in the field and have lived with the Pre-Tech concepts. We have to think of this as a continuum, starting in the high school to the junior college and in some instances on to 4-year programs.

Let us examine the evidence from the junior college point of view, and particularly from San Francisco's point of view because this is my particular perspective. In California, our Master Plan for Higher Education provides that the upper 12-1/2% of high school graduates will be eligible for admission to the University. The upper 33-1/3% may enter the State colleges and all high school graduates may enter the junior colleges. For the purpose of this discussion, let us think primarily of the 66-2/3% who do not qualify for the University. The junior colleges in California are doing a particularly good job in their salvage function. Unfortunately, too many students have had unproductive high school experiences. They have failed to reach their goals in a college preparatory program because of lack of interest, ability, and motivation; or too many have pursued a program of general education or vocational training which merely prepared them for the demands of the labor market. In spite of many strong efforts on the high school level, it is no secret that the present high school vocational efforts need a new look. Too often, these high schools are teaching the skills of another era to unmotivated students who are directed to these programs for custody rather than training. No wonder the morale is low. One Negro leader in our community recently stated that among his people, 25% of the high school graduates were unemployed, and 26% of the dropouts were out of work. This is a poor testimonial for the value of a high school diploma.

Here in San Francisco, 2/3rds of the high school graduates come to our City College. Of these 2/3rds, about 7% could have gone to the University had they so chosen. About 1/3rd could have gone to the State colleges. The rest, either due to absence of motivation or ability, or both, did not qualify. Some of these, through counseling and other efforts at junior college, elect more realistic goals. They select more of the 35 occupational majors we offer which lead to job entry. Currently, about 40% of our students are majors in occupational curriculums. The other 60% are aspirants to transfer. The proportions should probably be just the reverse. Too many come to junior college and pursue the same unrealistic goals as in high school. They fail to assess their ability and potential personal qualities, they are ignorant of their opportunities—they fail, they withdraw, and they enter the labor market totally unprepared.

The other day, I had occasion to talk to the principal of a local high school about this matter and I raised the question about the percentage of his youngsters that went on to junior college and it was quite high. He indicated, however, that of all his youngsters who went to junior college, 41% left in the first semester. These students are sometimes referred to as "latent terminals." Their presence on the junior college campus assigns to us the role of a holding institution. We are faced with the same dire consequences as the high schools. We must try to develop meaningful experiences in our community colleges for this group. Try as we might, it is a difficult fight. In 1953 at our College, 40% of our 7,000 students were enrolled in occupational programs. In 1963 (and we had worked hard in developing new programs and trying to enroll more students), we had more students in our occupational programs. We now have 9,000 students on our campus and only 40% of those are enrolled. So there is little wonder that when the Richmond Plan was developed we participated in every conference and we visited schools often. We liked what we saw—students who were interested and involved. We saw their performance improving, we saw changes in behavior and attendance and citizenship. We saw students with high morale. We met faculties who were no longer performing a holding function—they were enthusiastic, interested, committed to team teaching and the interdisciplinary approach. We met administrators who were happy and supportive (happy is unusual for administrators in many instances). The school was becoming more comprehensive. So we sold our district on establishment of a Pre-Technology program. But we also sold them on the potential for other areas. If it could work in engineering technology it could work in food service. It could work in visual arts. It could work in horticulture. It could work in the protective services such as police science and fire science. It certainly could work in the health services. And as we studied this thing, it became apparent to us that Marv Feldman had selected the most difficult field—the engineering field was restricted. First of all, the program is basically for male students. Secondly, it was for male students with technical interests and aptitudes, and it was for students of average or better ability. It was a difficult program to start. In that district there was no junior college program with which to articulate. And for the Pre-Tech there are fewer terminal job opportunities than there are for some of the other areas. Yet, it took.

We received a Ford Foundation grant—seed money, and that is the proper term for it—$75,000 to start Project FEAST. We are now involved in the Pre-Tech concept in two areas, in engineering and engineering technology and in FEAST, and I would like to report on our experience to date. I think we have some practical signs, practical criteria, for seeing how well we are doing. When we first developed this program, as should be the case in good pedagogy, we developed some goals, some outcomes, and I would like to go through them briefly.

First, we thought that involvement in this new concept would give new meaning to the high school experience of many students who lack aptitude, interest, and motivation to succeed in the existing college preparatory program. Too many of these, we felt, were presently dropping out or entering the labor market totally unprepared. The evidence is in on this goal. Undoubtedly, you have heard of the remarkable success we have obtained in reaching this objective. For instance, in FEAST, of the 50 original students, 40 completed the FEAST program. Only one was a dropout—the others left for the military, loss of interest, to marry, or moved. Of the 60 original students in our two San Francisco pre-engineering technology programs, 45 completed, 7 changed majors, 4 could not cope with the difficult subject matter, 2 moved, and 2 dropped out. The evidence there would seem to indicate that we are holding these youngsters in high school and we are succeeding in helping them cope with the problems of success in school and we have reduced the dropout rate.

Our second expected outcome was to place high school students in a position to select more realistic goals to prepare them to enter a job. Now these facts are in. Students' interest in the program is indicated by a number of things. No program, Pre-Tech or FEAST, has dropped because of a lack of student interest. And this is not a very wide choice. They have engineering or they have FEAST. I think they should have health services, business, horticulture, public service careers, and anything else. If you can do it in these areas you would be able to do it in the others.

But let's look a little further into this. Most of these programs have more applicants and this is an interesting phenomena—the high school occupational program where they select students. Of the original graduating class in the two FEAST high schools, 8 came to City College of San Francisco, 8 went to another fine junior college, 23 went to work, 3 went into the service, 2 married, and 2 changed their objectives. So in terms of our second expected outcome, they are going to junior college, they are going to jobs, and they are selecting realistic objectives. The returns on the job are excellent.

A third expected outcome was to improve the morale of teachers in many non-academic areas. We know that too many high school students, problem students, are being programed into vocational type subjects. This program has resulted in the demoralization of many teachers. It is planned, as we said at the beginning, that in the implementation of this program such courses (the vocational courses) would become part of a continuum leading perhaps to future study or to a job. Rather than working alone, these vocational teachers are part of a team with other teachers, junior college instructors, and representatives from industry. Now, what is the evidence there? In an article in the May, 1966, issue of Reader's Digest, one of the FEAST home economics teachers is quoted as saying, "I have been in this school for 20 years and this is the first time I have felt that I am really teaching something." Another defender of the program has stated, "The real value of the program is to the student. Many of them saw no value in school and did poorly in their studies. It has helped them to see a purpose and make full use of the fine educational opportunities provided at our high school."

It is difficult to document the enthusiasm of teachers for these programs. You have to see them at their meetings to really sense it. But the fact in FEAST, for instance, that they spend two successive summer vacations attending workshops is some testimony of interest. Some have left the program for marriage, others for pregnancy, and a few for transfer. But no teacher, counselor, or cafeteria manager has asked to be relieved. So I feel this particular approach has done much for the teacher who saw no real value in his work because of being assigned the holding function for the youngster who had no other meaningful program on campus.

A fourth expected outcome was to increase enrollment in the semiprofessional courses at the City College of San Francisco, or at any other junior college. The proportion of students majoring in these programs should be changed (we said that a few years ago and we are still struggling with it) to match more closely the nature of the student body and the job opportunities available in the community. More City College students should leave college prepared to enter an occupation rather than leave as totally unprepared youth who again fail to attain an unrealistic goal.

Of the original two Pre-Tech classes in San Francisco, as I indicated before, 45 completed the program. And this is the effect it has on our enrollment: 33 enrolled in our technical engineering—quite a thrust—2 of them went into other technical curricula (one in police science and one in business); 6 of these youngsters in the Pre-Tech program had discovered themselves and found direction to the extent that they were confident they could commit themselves to a bachelor of science program; and one was undecided. The other 3 went to Cogswell, which was a good decision because they have excellent programs in engineering technology; one to the military, and one undecided.

This is what the two FEAST programs did to our technical engineering. They have added considerably to our enrollment and this was one of our early goals. Eight from the two East Bay schools came to our campus, and Balboa High School tells us that they are sending 22 FEAST students, so now we are struggling with the problem of two entry classes instead of one. And if some of the other junior colleges don't come into this field we are going to be swamped with students, and this is because of FEAST. And I want to underline here that we are meeting an important community need. Just a month ago my advisory committee came to me and said, "Now, why does City College of San Francisco send all its Hotel and Restaurant graduates to the hotels and none to the restaurants?" I showed them the facts—actually, the students go in the ratio at least 2-to-1, closer to 3-to-1, to the restaurants rather than the hotels, and even then you are not training enough students—you better get to work! So we hope to solve that problem.

Another expected outcome is to strengthen the occupational programs. Because of high school exploration, occupational commitments of students should be firm when they reach junior college. Because of development of skills and understanding in high school, the needless repetition of courses would be eliminated. This will help meet the challenge of keeping up our semi-professional programs to meet growing technical demands of our product and the assignment of additional tasks to auxiliary personnel.

There isn't much new in education and the concept of a continuum from grade 10 to grade 14 was one of the basic concepts on which the junior colleges were founded. At one time the proper school organization was 6-4-4, the 4 years going from grade 10 to grade 14. And there is a lot of sense in that. This continuum makes better training. If we develop this type of continuum we will have meaningful training. I am sure the youngsters who have taken the high school pre-engineering technology, in relationship to their capacity and abilities, will be better engineering technicians just as the students in FEAST will be better. In any case, it has had that effect on us. We are finding out in Project FEAST that where we select and screen, we are taking youngsters with poor high school records and some academic deficiencies and they are coping and competing with people with better ability because of this experience.

In engineering technology an interesting thing happened. Our staff had been struggling for years (after all, the halo of ECPD accreditation is something to be sought after) and all our programs were ECPD accredited and this has rather high standards. Attrition was quite high and we had to come up with some change. When these Pre-Tech students came on campus one group that was selected were really engineering technology students. The others were having trouble with the math and the analytical aspects. Well, their coming on campus was just the impetus we needed to move our faculty to develop a program in industrial technology which is less analytical, a little more manipulative, stressing skills rather than theory. And of course it will not only serve these Pre-Tech students but it will serve many of these students who are dropping out of our engineering technology.

Finally, we felt that if the Pre-Tech program was implemented it would provide a basis from which the City College staff may proceed with confidence and develop more occupational programs. After all, you can't keep spreading yourself with occupational programs if you do not attract the students. And you have to develop some type of recruiting device so you can fill them. We felt that if we got into overall articulation this would result. We could move into other areas and there are many, many, many areas we should move into. So, that's the picture of our experience with Project FEAST and with Pre-Tech and with the concept of articulation.

What about the future? I don't think the concept has lost any of its relevancy. If anything the problem is more urgent than ever. Yet, we don't seem to move very fast. I remember I was shocked the first time I went into a curriculum class with an excellent instructor and he said, "You know, there has been nothing new in education for 50 years." I think there is a good deal of truth in that because even the ingredients of this program—the interdisciplinary approach, team teaching, articulation—have been with us a long time. I think we get into a rut. We get conditioned to doing the same thing in education—we don't look for new ways. And if we proceed in the same old way we are in trouble, because, in spite of much conversation it is almost universally realized that the solution to the big national problem of segregation and poverty are dependent on the ability to prepare those who are victims of these blights for meaningful and productive careers. We hear this every day. The opportunities for the unskilled are rapidly disappearing. We also know that every person, male or female, needs some form of occupational education. Those who do not need occupational training are the deficient who will be dependent upon society to take care of them. The economic well-being of our country is dependent on a well-trained working force. I think it would be less of a catastrophe if all the industrial plants in the Bay Area were leveled in one blow than to have all of their personnel destroyed. We need the working force.

And finally, of particular significance to the junior college is the prediction that 50% of those employed during the next decade will be skilled, semi-professional technical workers—all requiring a junior college education. Undoubtedly, the accent is on occupational training. There will be need for the pre-employment training of youth, need for in-service programs for the underemployed, need for retraining the displaced worker, need for continuing education for those faced with rapidly changing jobs.

We do move slowly. Another threatening thing is that there are those who doubt whether the schools can do this job. I read the other day in the paper that Camp Parks received its 3rd contract for 12-1/2 million dollars which is nearly as much as the VEA allotment for the State of California. Obviously they are doing a more effective job than many of us in education will admit. In addition to that, we have lost much of the confidence in the poor and the disadvantaged. I pick up the paper almost every day and read of some neighborhood group developing training programs.

We must realize that we are hardly keeping pace with our challenge. We have made progress, but the challenge now is greater than ever. We have had two great social developments that are multiplying the challenge here. One is Medicare and pre-paid dentistry. We know that the health service careers will be our Number One employer soon. It will create a tremendous demand for auxiliary personnel in present areas of employment and, in addition to that, a whole myriad of occupations is emerging, unknown presently, but developing in the future. There will be a tremendous challenge in the schools for this. Of particular relevance today, we must identify in the high school young people interested, say, in a health service career. Start them on a continuum, a core curriculum in science and related subjects in high school, leading to a junior college, then to a career, perhaps on the completion of high school, junior college, or maybe on to a State college in fields such as medical technology, occupational therapy, etc.

The second development, of course, is the new career movement. Now this is actually not completely new. It ties in to the concept we first talked about in the '30s and again in the '50s about intelligent manpower utilization—using professionals as professionals. We have talked about that for years, but a new dimension has been added now. The shift in employment patterns and the disappearance of unskilled jobs makes it necessary to refine career opportunities not only for the poor, but for the average and below average youngsters. Here again, we should identify these people in high school and start them on the ladder.

The Pre-Technology approach is not the only approach. But we know that it works. We know that it has the essential ingredients—strong leadership, administrative support, interested teachers, industry involvement, and an available junior college articulation that would do the job. We can multiply what we are doing in FEAST and Pre-Tech by perhaps another 15 or 20 fields.

The evidence is in now. It does provide us with an effective means of meeting our responsibilities and making our contributions to the solution of these important national and community problems. I think the time has come for us to spread our wings. I don't know what you are going to do, but in San Francisco we have a new Superintendent coming this year and I am going to go to my files and take out one of those proposals we spent a lot of time writing, dust it off, take it to him, and say: "Now is the time to articulate in all of our occupational curriculums. Let's go!"

A CURRICULUM IN ACTION — TEACHER EDUCATION

Dr. Helen Edwards Stadermann, San Francisco State College

Cultural, social, philosophical, and technological changes in our society make it imperative that innovation and change take place on all levels of education. Our student population is becoming larger and more diverse. Mobility, the influences of mass media, and the increasing demand for at least a high school diploma necessitates the development of curricula which better meet the needs of this student population. Since the school is the institution which can best prepare young people for satisfying and productive lives, it is necessary that educators be prepared to assume a responsibility far greater than ever before. We not only must consider all degrees of student needs and abilities in order to offer a truly comprehensive program on all levels of education, but we must also anticipate society's changing demands. Education must help prepare young people for occupations or careers which now are available, yet must be structured so future technological changes and demands do not leave them unprepared for occupational or professional positions. As educators we must provide opportunities for a wide variety of experience for our students; we must enable them to develop their individual interests; we must stress the process of education and the problem-solving approach; and we must encourage them to be receptive to change. As educators, we also must assume a responsibility to make education available to individuals when needed. As the demand for more and different kinds of skills are required by our technological age, we must be sure that continuous education on all levels is available for those individuals who so desire it.

Dr. Harry Broudy, Professor of Education at the University of Illinois, was one of the principal speakers at the annual conference of the Association for Supervision and Curriculum Development, held in San Francisco in March, 1966. Speaking on innovation and curriculum development, he stated: "If innovation is to take place successfully, to be incorporated into the schools as a part of a continuing offering of the curricula, teacher education must be involved."

Traditionally, teacher education has had little influence on changes in elementary or secondary school programs. Faculty of teacher-preparing institutions have not been included in planning, developing, or evaluating innovative programs. Colleges and universities have not perceived their role in teacher education as one for instituting innovation in elementary or secondary schools. Their primary function has been that of preparing teachers who may or may not be involved later on in curriculum evaluation and development at the schools where they will teach. In addition, it appears evident that many teacher-preparing institutions have ignored the obvious fact that educational change does have roots in teacher education programs. Since many teachers teach as they have been taught, and formulation of educational philosophy, teaching style, and attitude are acquired or reinforced during professional education programs in teacher education, it is essential that channels of communication be developed for innovation on all levels of education.

Broudy states: "There is no systematic way at the present time of introducing these innovations into a teacher education program. The professor of education in colleges of education is still the strategic figure in teacher education, and while he can be bypassed now and then by institutes and in-service improvisations, the great stream of teachers will not be affected by these loopings around the standard curricula for teacher preparation."

It would seem, therefore, that for major changes in curricula and for real innovation which results in change, teacher education must be involved. A School of Education obviously cannot implement its program in order to meet the needs of all particular instructional programs of pre-service teachers. Information and skills, philosophy, ability to work with others, an acceptance of the interdisciplinary concept, and a concern for the personal growth of young people should be essential for all teachers. Added to these factors must be a desire to cooperatively plan and experiment. Curriculum development through evaluation and innovation can be successful only if teachers play the major role. It is essential, therefore, that prospective teachers be prepared to contribute to changing curricula programs. Involvement in curricula for action should be essential for teacher education programs if educational theory and practice are to meet the needs of our time.

San Francisco State College long has been known as an institution which welcomes and initiates innovation. At the present time, there are project, grant, and individual research studies undertaken in every school within the college.

In the School of Education alone, there is research underway dealing with every age level of education from pre-nursery through college instruction. There are other studies which are focused on the community itself and urban development.

The Department of Secondary Education has become increasingly involved in various kinds of research. It has led us, as a department, to consider carefully our basic commitment to teacher education as our prime responsibility. We believe that we cannot become involved in research unless two major criteria are met. First, since our major function is that of preparing secondary school teachers, we must not engage in so many research responsibilities which would drain off our regular faculty. Second, any project we undertake must have a direct validity for, and an implementation into, our existing teacher education program. Any additional insights regarding necessary change for prospective teachers would be incorporated into our program of teacher education.

The Center for Technological Education at San Francisco State College has been directly responsible for instituting curricula in secondary schools through innovative programs called Pre-Technology and the FEAST Project. It was apparent to the Director of the Center, Dr. George Champion, and to the College Advisory Committee that these innovative curricula had direct implications for teacher education programs. A pilot program was requested with an interdisciplinary approach to secondary teacher education for the school year 1966-67. In the opinion of the Secondary Education Department, this cooperative venture would meet the criteria for involvement in projects. The program could be absorbed directly into our existing teacher education program and results would be quite visible. In addition, this pilot study would enable us to implement the professional sequence interdisciplinary approach with contributions from certain major and/or minor subject departments.

The Interdisciplinary Program for the preparation of teachers for Pre-Tech and FEAST programs in secondary schools is now completing its first year as a pilot program in teacher education at San Francisco State College. Fourteen students were selected for the program. The criteria for selection were a B.A. degree, a major in a subject area needed to teach in Pre-Tech or FEAST Programs, indication that all California secondary credential requirements could be met in two graduate semesters, and approval by the College Advisory Committee Consultants for the Center for Technological Education. Subject area majors represented were English, Mathematics, Physics or Chemistry, and Industrial Arts for the Pre-Tech Program; English, Business Education, and Home Economics for the FEAST Project.

The primary purpose of the Interdisciplinary Program in Teacher Education was to prepare prospective teachers to articulate their subject areas with those of other disciplines, to engage in term planning, to see the relevance of one subject area to another.

The professional sequence of social foundations, psychological foundations, secondary curriculum, and the student teaching seminar has been taught over the period of two semesters as an integrated instructional seminar by a college teaching team. Involved occasionally in the seminar, as supervisors of student teaching, and as consultants, were the College Advisory Committee Consultants from the subject areas represented by the students. Attempts were made throughout to encourage the fourteen students in our pilot program to regard teaching from an interdisciplinary framework. Student teaching assignments in secondary schools were made for the students in Pre-Tech and FEAST classes and in regular secondary classes.

The professional seminar, course work and methods courses in major and minor subject areas, and student teaching extended over the two semesters. The perceptual approach to teaching has been stressed throughout the professional seminar. While the prospective teachers have been encouraged to perceive the relationships among subject areas, they also have indicated increasing acceptance of each others' ideas and perceptions. The students have been allowed to develop their own teaching styles and to continuously engage in self-evaluation. They have developed increasing security in a self-concept. They appear comfortable with themselves, with each other, and with their instructors. They have been especially secure in the student teaching situation. Above all, they appear to understand the relevance and relationship of one subject area to another.

In conclusion, the Center for Technological Education and the Department of Secondary Education at San Francisco State College presently are planning for a full team of forty students to be selected for an Interdisciplinary Program in Teacher Education for the school year 1967-68. Three college instructors, representing the social foundations, psychological foundations, and secondary curriculum, will again act in the team teaching relationship over the period of two semesters. College consultants from the subject areas concerned will be involved in the professional seminar as well as on a consultancy basis, and will share in the supervision of student teaching in secondary schools.

The secondary school Pre-Technology and FEAST Programs of curricula in action have directly influenced teacher education at San Francisco State College. With the demand for a different approach to teaching, teacher education also is involved in its own curriculum in action.

A MANAGEMENT APPROACH TO MAKING EDUCATION RELEVANT

Wallace J. Fletcher, Research Associate, Harvard University

Sir Winston Churchill once defined the most efficient form of organization as that of a committee of two, one member of which never attended meetings. Sir Winston was reacting to what Burnham described 20 years ago as the "Managerial Revolution." The conduct of most enterprises today is in the hands of professional managers, including the Education Enterprise. Given the concept of a management component, it follows that the responsibility for the engineering of change (and, indeed, to make education relevant represents a major change) is clearly a management function.

It is my intention, therefore, to analyze the management function and then, within that context, discuss the Newton Plan.

Any management approaches the problem of change with an established group of resources and constraints. The resources commonly agreed as accruing to management are money, manpower, materials, and marketing, with management itself performing the function of coordination and policy definition in relation to the other four resources. Its constraints can generally be defined as:

1. The structure of management and of the institution itself.
2. The degree to which provision for change is built into the managerial structure and the institutional structure.
3. The terms in which the goals of the organization are defined.
4. The degree to which management determines recruitment, administrative structure, rules and regulations, and rewards and punishments.
5. The readiness of its market to accept the products of change; and here the market is defined in terms of its social, economic, political, and cultural value systems.

6. The availability of the resources, financial, human, and material.

If we now analyze public school systems in terms of these resources and constraints, it becomes possible to predict methods by which change can be most easily facilitated and the limitations on the quality of the changes possible.

Resources and constraints

I Money—This is a resource the availability of which is limited by the degree to which local taxpayers can be persuaded to support the educational venture. It is important here to recognize that schools are the socializing agent of the society. And to the extent that this is true, since society tends to be conservative, the institution which is their agent will also be conservative. The medium through which the local society expresses its financial commitment is through voting on the budget requests of the School Committee and the kind of budget which the school committee develops upon which they will vote. It is significant here to recall that in his study on school boards, Cronin states unequivocally that rather than seeing themselves as educational leaders, school committees, in fact, see themselves as arbiters of economic efficiency. Clearly the constraint here is severe.

In most communities the largest percentage of money for school support comes from a real estate tax, and it therefore follows that the strongest influences upon the generation of finances are the owners of the highest valued property. It is usual to find that such property owners tend to be among the more conservative college-oriented element in the community. Thus, a prime constraint upon the resource of money is the parochialism of the local community in terms of the purposes for which it is willing to raise money to be applied in the educational process. It is not surprising, therefore, that this parochialism effects the expenditure not only of locally generated funds, but also of funds obtained from outside sources; and it is perhaps in this direction one might look for an explanation of the very limited "generalization" of a multiplicity of successful "pilot" programs.

II Manpower—It is clear at the outset that one of the constraints of manpower acquisition and utilization lies in the limitations imposed upon school systems by certification or licensing procedures. It is also apparent that in terms of the type of pre-certification and pre-licensing training programs available and of the limited resources for in-service training, management faces a marked limitation in its ability to maintain flexibility in its acquisition, utilization, and retraining of personnel.

A factor which has not yet been fully investigated in relation to school management, but which should be noted, is that the population distribution by age indicates, during this decade, a marked increase in the percentage of those over the age of 45 and a shortage of those in the 35-45 year age range. When one couples this fact with a large increase in the 20-30 year olds, it becomes apparent that the bridging generation which management has used traditionally to influence both its older workers and its newer recruits is missing. We are all aware of the limitations on the choice of manpower for assignment which tenure laws impose, and these laws help to compound the previously described condition.

A factor which will become more significant during this decade is the competitive nature of the labor markets from which school systems are attempting to draw their manpower. School systems no longer offer any greater security and/or other fringe benefits than private or governmental institutions in competition for the same type of manpower, to offset the markedly lower salaries which school systems offer. One might state the general problem of manpower as one of a limited availability of supply not only in quality but in quantity in a disadvantageous market.

III Materials—It is useful to think of materials in three classifications:

A. Physical facilities (buildings);

B. Improved machine technology; and

C. Most important, the materials that are worked on to become the product of the process.

It can be stated as a generalization that in terms of physical facilities, school systems as institutions are approximately 30 years behind the times in the application of the principles and products of technological change. Despite the efforts of The Ford Foundation on the one hand and the combination of another California institution of higher learning in collaboration with the steel industry on the other, one sees that, if indeed, the fundamental principle of architecture is that ''form follows function'' the very nature of physical facilities of present day school systems has already defined the function by the rigidity of their form.

It is apparent that given the nature of the local financing of educational effort, most communities are unable and unwilling to assign an adequate budget for expenditures on the development and preparation on new instructional devices and materials. Clearly, there is a minimum operational size below which a critical mass of effort in this direction can be neither mounted nor sustained. However, educational managers can look, in the future, to an increased availability of software and hardware curriculum packages. Such packages will result from the recent corporate marriages between hardware manufacturing and marketing businesses, and educationally oriented institutions — for example, the General Electric Company's marriage with Time-Life, Inc. resulting in the offspring, General Learning Corp. However, it is here that perhaps educational managers must be most careful, for while some of the products of such corporations will be good and some will be new, it does not necessarily follow that all that is new will be good nor all that is good will be new. Certainly, evaluations of PSSC physics and the New Math as transmuted by classroom teachers indicate that in too high a percentage of classrooms the pedagogic style of the teacher to a large extent mitigates the learning experience for children intended by the designers of the curriculum.

One of the constraints faced by educational management that is not faced by most other managements is the paradox that in an educational organization the only real way to test the worth of new materials is in an operational relationship. By contrast, in the field of pharmaceuticals, new drugs are rigorously tested upon animals and reach the general public only after massive testing of the products have proven them to be safe and sometimes an improvement over drugs already available—our problem in education is that our patient is also our guinea pig. I am aware that raising this point raises a number of ancilliary issues which we do not have time to go into, but the point must be made. I might add that I do not share entirely the viewpoint of some of my colleagues that Job Corps and dropout centers perform the same function for the educational institution that the laboratory does for the pharmaceutical institution. There is a danger in assuming that the subjects in such settings are in fact representative of the general school population. Thus, as reports of the results of Job Corps programs become available, they must be carefully examined by educators with this thought in mind.

IV Marketing—It is in this area that the distinction and difference between management of the educational enterprise and that of other production organizations becomes clear in its complexity. There is, in effect, no real marketing structure on the public education level, except as an extension of and supported by the local community's attitude.

The paradox in the marketing area is that the product of education in a very major sense is also the consumer. And in education we define this hybrid as the student. The concept of the student as a product is validated by the observation that the student is made available for purchase by the ultimate consumer, which is the society. A complicating factor here, however, is that the society, or the markets in one sense, is made up of many consumers who often possess conflicting needs, mores, and values.

An example here that might be made in terms of class relationship. We have already indicated that the parents who provide the major financial support of the power structure which controls the school system, in fact, by such control establish priorities for managerial decisions made within the school system. However, we have already indicated that the more affluent parents are those inclined toward requiring the school system to produce in their child a capacity to be a college entrant. It is significant in this context to note that in a national scale only 20 percent of any 7th grade class will ultimately graduate from a 4-year college. My Scottish prejudice must show here when I emphasize the point that there is a much wider spectrum of quality within these 4-year institutions as compared with the universities accredited in Great Britain. It could reasonably be argued that despite our emphasis on the Democratic nature of the American educational process, no greater percentage of the student population at risk, in fact, obtain a first-class university education in the U.S. than in Europe.

Having indulged my chauvinism, let me return to the burden of serious discourse. Probably the most significant difference and conflict existing within the needs, mores, and values of the "society" is that between the lower-class and the middle-class parental scales. It is apparent that the middle-class values win out. I would here emphasize by an example. A member of the Board of Alderman and of the Finance Committee of the Board of Alderman of a somewhat affluent society, certainly less than 1000 miles from Cambridge, Mass., once defined publically the responsibility of his school system as "to get every kid into the college of his parent's choice!" My somewhat intimate experience of such a school system indicates that the laughter of educationists reciting this incident to me tends to be somewhat hollow. As a general rule, one might state that change within the school system is usually not obtained by the influence of the marketing effort of the school system, but in fact occurs only within the approved middle class, i.e., college-oriented values, of those parents who represent the power structure which controls the financial base of the educational effort in the community.

Apart from this privileged group of societal consumers, it is apparent that the rest of the consumers, either societal, i.e., parental, or student, have no choice in relation to the product they will consume, be it as an employer of the student graduate or dropout of the system, or be it the child who is the student consumer. It is apparent that the only alternatives available to the student, i.e., the 80 percent who did not go on to college are acquiescence in the process or a "tuning out." I merely note here the appropriateness of the term "tuning out" since in essence the educational system as the agent of society is a system which communicates to the child not only data about facts, but data relating to values, not the least of which is the value which the system places upon the student as both consumer and product. As Jules Henry has stated, "Pupils learn in the noise rather than the stream of explicit explication in the classroom."

Clearly the implications of this situation for self-worth concepts of the student have already been belabored many times. But nonetheless, I view it as a highly significant constraint upon the capacity for change, significant change, relevant change of the educational process.

V Management—It is necessary here merely to note that, given the constraints in relation to resources defined above, there is an acute need for highly trained and intelligent managers of the educational enterprise. We have learned in industry that managers are not born so much as they are made. The proliferation of in-service training programs for managers and the existence of undergraduate and graduate schools of business administration and business management indicate the seriousness with which the business sector of the community views the role of the professional manager.

It is regrettable in my view that not only has the educational enterprise neglected to develop a comparable structure of training institutions, but indeed has not as yet accepted the challenge of defining the basic responsibilities of managers of the educational enterprise, thus avoiding its responsibility to develop the nation's most valuable, natural resource—its youth.

Given the analysis of the managerial components in education it is now appropriate to define the Newton Problem and Plan as envisioned in July, 1964.

Background

The Newton Public Schools comprise a system of twenty-five elementary schools, five junior high schools, two "comprehensive" high schools, one technical-vocational high school, and one junior college. The junior college and the high schools are accredited by the regional accrediting institutions.

The Newton community, over the years, has shown itself to be supportive of its schools and interested in quality education. The city, as a whole, includes a full spectrum of socio-economic levels and of educational aspirations, although 10 percent of the families have incomes below $4500. Within this range there is a median income well above the national average, and a discernible view of post-high school education as something of great value. The high school dropout rate is less than 2 percent, and some 70 percent of high school graduates go on to additional education. About 60 percent go to four-year colleges.

The educational program at the two regular high schools is offered in three curricular tracks, of which Curriculum I prepares the most able students for rigorous four-year colleges; Curriculum II prepares students for some four-year colleges, schools of art and music, business schools, and junior colleges; and Curriculum III provides a terminal educational program. There is enough flexibility in this structure to enable a student to study certain courses in Curriculum I and others in Curriculum II, depending upon his needs and capabilities. That is, the curriculum designation is attached to the courses rather than to the students.

The comprehensive high schools offer courses in industrial arts, technical drawing, home economics, and business education, in addition to the academic courses. At the junior college, besides the academic courses, there are offerings in business education, electronics, data processing, and nursing.

The technical-vocational high school, which is attached to one of the two comprehensive high schools, is operated as a separate institution. It offers programs in auto mechanics, cabinetmaking and mill work, electrical work, electronics, machine shop, printing, and sheet metal work. The shops are well equipped for these programs, which are well regarded among schools of this type. Students in the Newton Technical-Vocational High School (all boys) are selected, usually at the end of the ninth grade, from applicants in Newton and nearby communities, on the basis of simple tests in arithmetic and mechanical aptitude. Non-resident students are charged for their tuition, which is paid by their home community.

All of these schools are maintained and operated under the direction of the Newton School Committee through the Superintendent of Schools. However, in the Newton Technical-Vocational High School, certain requirements of the Division of Vocational Education of the State Department of Education must be met in order to qualify for State and federal funds. These requirements control the course content, the time allocations, and the qualifications of the staff.

The Problem

Out of a total high school population of about 4300, two hundred Newton boys attend Newton Technical-Vocational High School. Under the State-approved program, their time is divided in alternate weeks between the shops and the related academic subjects. This schedule makes it impossible to schedule these boys into classes in the comprehensive high school in the same building, or for students in the latter school to take any technical or vocational courses. A clear choice between the two must be made; there is no middle ground.

In the Newton community a high status value is attached to the college preparatory programs at the high schools. For most families, if there must be a choice between college prep, or a technical-vocational program with no college preparatory work, it is the former which gets the nod. This choice is likely to be made even if there is some question about whether a college preparatory program is the best answer to the educational needs of the boy in question.

There are two unhappy consequences of this situation. In the first place, boys (and girls) who might benefit from an opportunity to include technical-vocational courses in their high school program are prevented from doing so. Additionally, the boys in the technical-vocational high school are cut off from the usual high school contacts, including varsity sports, clubs, and even lunch period socializing. They attend an all-boys school inside a co-ed high school.

There is a self-perpetuating cycle which first makes the technical-vocational high school less available to the academically oriented youngster, and then less attractive, and this, in turn, fills it with the students who are less talented academically, which in turn makes it, if not an outcast society, at best, an undesirable address.

The problem is to develop a program which can break the cycle, permit a freer flow of students between both societies, and bring the educational benefits of both to as many students as possible. We think that the plan which follows can do this, and are requesting a grant which will enable us to implement it.

The Plan

In Newton High School

Our experience shows that the special facilities of Newton Technical-Vocational High School can service more students than are now enrolled. For the reasons described above, we cannot recruit more boys into that program. We propose instead, to establish in Newton High School a Department of Technical and Vocational Studies. The function of this department will be to establish, within the existing structure of the comprehensive high school, a program of studies which would be available to qualified students of this school, using the facilities of the Newton Technical-Vocational High School. Since these studies would be part of the Newton High School program, the requirements of the State Division of Vocational Education would not apply to these students, nor could any reimbursement be expected from the State at this time. Class schedules of the Department of Technical and Vocational Studies would be arranged in phase with Newton High School's master schedule and with available facilities in the Newton Technical-Vocational High School. Courses in the Department of Technical Studies would be offered on an elective basis in the same way that courses in other departments such as science, foreign languages, art, or music are offered. The result would be to make technical-vocational education available to students who did not wish to enroll in a special type of school, as well as for those who chose to do so.

A second phase of this plan would include the already existing Newton Junior College. Using this facility, we propose to develop a number of technical-vocational courses that would embrace the 13th and 14th years, thus producing a number of highly trained graduates ready to fill the labor needs peculiar to this particular locale.

We approach our consideration of Technical-Vocational programing with the attitude that the limited trade school curriculum approach is not appropriate to modern society.

It is our position that in order to meet community needs of students and industry and commerce we must recognize that the pool of jobs for untrained high school graduates is shrinking rapidly. While the school system cannot and must not avoid its responsibility to provide a sound basic educational core-curriculum in the liberal arts, it must also accent the responsibility for meeting pre-entry skill levels to the working community.

As Grant Venn points out in his book, Man, Education and Work, "Industry has little place for the young worker without a skill; the Armed Forces offer fewer and fewer opportunities for him. At the same time, with two or three years' occupationally oriented education at the high school or junior college level a great many of these same people could qualify for meaningful jobs on the skilled technical and semi-professional levels, where there are acute manpower shortages." Venn goes on to say, "The most significant aspect of the new technology is described by the word 'change'. It is not simply a case of new sets of social and economic relationships replacing older ones, but of the new ones themselves being replaced at a faster and faster rate with only those adapted to change surviving. This concept of change is not new; what is new is the change in the rate of change."

It is clear, therefore, that imagination and maximum flexibility in our approach to Technical-Vocational programing are mandatory.

In achieving an extension and improvement of Technical-Vocational Education up through the junior college level, five principal elements are involved:

A. Parental and Community Attitudes Toward Technical-Vocational Programs;

B. Students' Attitudes Toward Technical-Vocational Programs;

C. Guidance Personnel Attitudes Toward Technical-Vocational Programs;

D. Technical-Vocational Orientation and Programing in Junior High School;

E. Broad Spectrum of Technical-Vocational Curricula.

A. Parental and Community Attitudes

Clearly, no modification or extension of Technical-Vocational curricula can be successful without clear understanding and strong support based upon such understanding from the community. We will determine existing attitudes and the underlying factors of which they are a manifestation.

After evaluation of the results we intend discussing the data with experts in the field of Public Relations and Communications. From these discussions we will develop a program to reinforce and develop positive attitudes and modify negative attitudes among parents.

B. Student Attitudes Toward Technical-Vocational Education

We suspect that student attitudes will in large measure reflect those of their parents. However, we recognize the growing emphasis upon economic independence among adolescents—"I need a car," "I want to get married" —the lack of vocationally oriented programs as alternatives to the high school Curriculum II and the peer group effect of these upon students as factors influencing realistic career planning.

It is our belief that the program outlined in this proposal will affect in a positive way the attitudes held by students toward vocational-technical education. In addition, Section C below outlines our plan for affecting these attitudes through a program of guidance.

C. Guidance Personnel Attitudes Toward Technical-Vocational Programs

Whatever the strength and direction of parental attitudes and student attitudes toward Technical-Vocational Education, it is clear that the administration influences students strongly through its guidance program. We recognize guidance as a specialty having responsibilities for social adjustment, educational planning, testing, and vocational planning. We need to determine the amount and validity of vocational emphasis in our guidance program. Such a study would be designed to contain the following elements:

I Codification and statistical analysis of counselor's records.

II Evaluation of counselor attitudes as demonstrated by knowledge of vocational areas, pre-entry educational level and type in such areas, institutions offering such education, personality and innate skills having significant effect on vocational success, etc.

III Educational, personality, and attitude profile of counselors judged most effective in vocational areas by I and II above. We expect that due to the academic program/college placement emphasis in guidance and the de-emphasis of vocational guidance in counselor training, little emphasis on counseling in this area will be found. However, the development of Technical-Vocational curricula as described below makes a strong vocational element in our guidance program mandatory. Programs of counselor orientation and training will be developed from the results of the counselor attitude study. For this purpose, we will establish a nucleus team consisting of a representative of our guidance department, the Assistant Superintendent for Personnel, the President of the Junior College, and a specialist in Vocational Guidance. Resource consultants from industry, commerce, and the Federal-State Employment Program, among others, will be used as required to develop the program. As our Technical-Vocational curriculum broadens and deepens we expect to repeat elements of the counselor attitude study at regular intervals to determine its impact and that of the counselor orientation and training program upon the quality of counselor attitudes.

D. Technical-Vocational Programing in Junior High School

A broadening spectrum of technical-vocational courses at the high school and junior college level will be used judiciously by students if their level of aspiration arises from understanding their capabilities in relation to vocational requirements. Strengthening of our guidance program described above will contribute to this end but is not sufficient of itself. We will develop a continuous teaching program commencing in the 7th grade to teach self-study and self-appraisal as well as job-analysis. We will attempt to simplify vocational choice through a number of sequential subchoices and decisions based on work-trial experiences, gradual self-discovery, and occupational exposure.

We must and will expose students to the adult work world by an expanded "visits to work" program including establishments typical of new technological, commercial, and service industries. Time consumed in such visits limits their use. Therefore, we hope to develop audio-visual programs, including films and film strips, to increase the amount of occupational information and "atmosphere" available.

We recognize this major problem is not peculiar to the Newton School System and hope to develop a television series in collaboration with WGBH. This series would meet the need in all school systems receiving NET broadcasts.

E. Broad Spectrum of Technical-Vocational Curricula

Our approach to curricula is to some extent based on logic and to some extent upon experience. The logic dictates the following general criteria:

1. Evidence of occupational need;
2. Evidence of professional endorsement and support;
3. Evidence of potential student interest and enrollment;
4. Determination that proposed program is compatible with most advanced educational philosophy;
5. Determination that similar programs existing elsewhere in the community or nearby are inadequate to meet the needs of Newton students in terms of cost, curriculum, or vacancies.

In implementing our curriculum development we will consult with professional and trade association representatives and individuals in specific job areas to determine present and future labor needs. Where needs exist we will develop appropriate curricula again in consultation with the industry or profession. Wherever possible, we will develop core courses common to a number of sub-specialities through the sophomore year with specialization in the ensuing two years. When educational levels of a higher order are required, core courses might extend through the senior year with specialization in the ensuing two years at the junior college.

We expect a diversity of educational pattern ranging from work-study programs commencing in the junior year to courses involving no on-the-job training but requiring intensive laboratory experience within the school curriculum.

The increasing rate of technological change and increasing emphasis on the service industries are major concerns in our planning and require action in two areas:

I Maintaining tightly knit relationships with the professional and trade groups described above to ensure that curriculum changes in established programs are made to keep pace with "state of the arts" changes in the profession or trade.

II Developing and maintaining close relationships with Federal and State officials and industrial economists responsible for projecting long-term economic and social trends.

We intend exploring the vocational possibilities and training required in many areas and to develop courses for an expanding spectrum of opportunity as shown in Chart I.

In terms of this analysis we recognize, therefore, a need for a medium to minimize the constraints, capitalize on existing resources, and gather additional resources in maximizing the potential of the Newton Plan in terms of its theoretical and practical implication.

Whether consciously or not, the significance of Carlson's monograph "On Executive Succession," in its emphasis on the outsider as the symbol and instrument of change, was fully implemented. The outsider was brought in as a consultant with the lack of definition in this title adding some power to the fact that the holder of the title operated from the Office of the Superintendent. It was assumed that the responsibility of this person was to change rules, reorganize existing relationships and inform both management and staff of the most likely activities in which to engage for the maximum return in terms of change for dollars invested.

This person was a non-traditional educator. It is significant that while recognizing the need for an educator, it was also recognized that the conditions existing in the system which it was designed to change had been produced by educators of a traditional bent. It was felt that the non-school expertise in management and education possessed by the consultant would offer a channel through which resources outside the school system could best be sought and acquired to assist the process of change. Finally, ultimate authority in deciding the allocation of the resources provided by The Ford Foundation and the Newton

School System was invested in the consultant for at least so long as such authority would maximize reorganization for change within the system.

Program Development

The initial thrust of the program was at the junior high school level. It was apparent to me that if we were ultimately to develop a reorganization of the high school program, it was necessary to prepare pupils within the junior high schools to an attitude of mind appropriate to that new organization. Certain elements of administrative ease offered themselves in that the pressure for the Carnagie unit as a prerequisite to college preparation and entrance was not a major factor. Further, the administrative ease of choice between the principals of five junior high schools rather than of two senior high schools was a factor. A prime consideration was that the junior high schools offered first opportunity in the system for individualized programs, the introduction of the guidance process through the guidance system which did not exist at the elementary grades, and the possibility of viewing the pupil as a decision-maker. It was also significant that a defined goal of the school system was to introduce students to the exploration mode at the junior high school level. The system also identifies and allocates pupils into curriculum tracks for the first time at grade 7 in the system. It appeared that if the tracking system were to be tackled at all, it would be most effective to tackle it at its inception in junior high school rather than at its conclusion in grade 12.

It was my opinion that, although The Ford Foundation had generously granted $430,000 for a 3-1/2-year period for the conduct of this program, to adopt a simplistic distribution of the funding on an annual pro rata basis would place an unreasonable constraint upon the power of money to effect change; therefore, the bulk of the funding should be expended within the first two years with a tapering off towards the conclusion of the project. Concurrently, the consultant would work with the administrative structure and the School Committee to effect transfer of the support of the programs of demonstrated worth from The Ford Foundation funding to school budget and/or the State Bureau of Vocational Education funding on a regularized basis.

With this in mind, we began programing in five areas.

1. Guidance Program;
2. Curriculum Revision;
3. Teacher Training;
4. Creation of a Department of Technical-Vocational Studies;

5. Technical-Vocational Work-Study Program—Terminal and Transfer.

I viewed No.5 above as a prerequisite to developing an extensive program of cooperative education which, in my judgment, offered the best possibility of affecting the constraints previously described working upon the Newton School System in common with other educational institutional efforts.

Guidance

Since the passage of the National Defense Education Act, the emphasis in guidance has been principally in the academic area. Therefore, our position was to redress the imbalance of emphasis. To this end, the following steps were taken. A number of counselor orientation presentations were made by the consultant working closely with the Assistant Superintendent of Pupil Personnel Services. The thrust of these presentations was to generate increased awareness of the role of Career in the life patterns of students and the implications of such understandings in the counseling process. A further step was to hold a three-day joint Couselor-Home Economics-Industrial Arts Teachers Training Institute in collaboration with the State Division of Vocational Education to develop understandings of the effect of technological change upon the national labor market and thus upon curriculum and career planning.

We developed a Career Guidance Information Resource Center within the Newton Public Schools designed to establish systematic procedures for the acquisition, storage, retrieval, and dissemination of all types of occupational information, both of a regional and national nature. This resource has since become a part of the joint Harvard University-Newton Public School System "Prototype Computer-based Information System for Vocational Decision-Making," funded by the U.S. Office of Education.

In assessing the value of our educational offerings and in considering changes and improvements, we determined that an important source of information which should not be overlooked was the former students (both graduates and dropouts) of the system. We established a major Follow-up Study of graduates and dropouts of the Newton High Schools, which has been tested and revised. It is hoped it will be continued as an ongoing annual undertaking of the Newton Public Schools. The use of the follow-up program as an essential part of the Career Guidance Information System described earlier is self-evident.

Curriculum Revision

We have instituted a team-teaching program at one junior high school which, during a three-year period, will undertake a united effort of guidance with curriculum disciplines in social studies, industrial arts, home economics, English, music, and art. The validity for the integrated approach lies in the realization that no individual or aspect of the social organization exists or may exist in isolation. For an individual to make intelligent choices, he must gain the perspective offered through a united team effort. The goals of the team are to establish the background and to provide suitable learning conditions so that each pupil will:

A. Study the effect which changing technology has had on historical and current social structures.

B. Study the effect of the dynamics of the interrelationships of the society—its economics and technology.

C. Study the structure of the "world of work" with sufficient understanding to determine alternatives and approach intelligent choices.

D. Undertake critical realistic self-evaluation in relation to choice-making and involve himself in those activities synthesizing the above three dimensions.

In another junior high school, a program was designed specifically to assist in guiding and correcting the following characteristics commonly identified with the gray area or "educationally disadvantaged" student. They possess:

1. A poor attitude toward education (i.e., the system).
2. A continuous history of failure and underachievement.
3. A sense of rejection by adults and peers.
4. Poor study habits.
5. Little sense of personal or group responsibility.
6. A lack of motivation and direction.
7. A low level of reading and arithmetic skills.
8. A lack of knowledge of career areas or vocational possibilities.

The particular junior high school's evaluation of such children lies in their designation as "non-foreign language children."

The program attempts to develop and focus the child's interest in the educational process by using the home as a vehicle. The child is free to make choices among 64 projects which are arranged in four levels of sophistication and deal with:

1. The planning, construction, and furnishing of a home.
2. Those social activities necessary in effectively living in a home.
3. The economic implications of home ownership.
4. The business and industrial enterprises which have developed to support the home and the homemaker.

The students work with teacher specialists in home economics, industrial arts, and art education, who are responsible for helping select pupil projects and follow-through. The students have a responsibility to evaluate what they are doing during their work-time and, at the end of their project, by completing a Self-Evaluation form and a "Daily Learner Log." The program is amplified by field trips to outside resources and by the introduction of specialized resource personnel whom we have termed "teacher-consultants" and who are not certifiable.

It was deemed necessary to strengthen the Industrial Arts offerings at the junior high school level as a necessary support to an increased emphasis on change and technology. To this end, investment was made in the development of programs in electronics, graphic arts, mechanical drawing, metallurgy, and modern wood technology.

Teacher-Training

The above curriculum changes could not be effected at anything other than a minimal level without a heavy investment in a retreading of the existing personnel and the acquisition of new teachers whose experiences and skills were in something other than the traditional mode which we were attempting to break. Further need for extension of the teacher-training program became apparent when an examination of the junior high school population revealed that from approximately 7 percent in one high school to approximately 30 percent of students in another high school, were definable as "culturally and educationally disadvantaged." This, of necessity, forced us to emphasize the mode of teaching which would be applied as being equally significant with the content.

We, therefore, introduced a pilot project in collaboration with the Newton Baker Research project on pre-delinquent boys which has a strong sociological thrust in evaluating the causes of pre-delinquent behavior. It establishes adult-child relationships as a means to redirect the activities of youngsters into productive rather than destructive channels.

In implementing items 4 and 5 in the program, i.e., the creation of the Department of Technical-Vocational Studies and the development of a series of terminal and transfer work-study programs, a common mode has, in my judgment, demonstrated its validity. The use of cooperative education has steadily expanded at the 4-year college level during the last 15 years and it is significant that during the last year The Ford Foundation has allocated in excess of $1 million of funds to foster such development.

I am now satisfied that the continued development of a Department of Cooperative Studies, at the secondary level, as a central agent for change both in curriculum and in management of the educational enterprise is a principle means of combating the constraints in relation to resources which I defined in the first segment of this discussion. I have recommended that the final year-and-a-half of Ford Foundation funding in the Newton School System in large part be allocated to the development of this area and structure.

I state this as so unequivocally because our experience of two summer programs and 1-1/2 years of ongoing programs have demonstrated remarkable results in terms of pupils, teachers, community, and the very structure of the school system itself.

It was as a direct result of the degree of static developed within the administrative structure of the school system that an Executive Council to determine policy for the management of the Technical-Vocational Development Program was created last summer. I must confess that I had reservations as to this mode of implementation of change but at least it offered the possibility of placing real responsibility for either decision-making or non-decision-making upon the administrators who have at least titular responsibilities for the administration of the school system at the pupil level.

The Executive Council, in effect, serves as the arena in which open discussion of the implications of change, minimally for pupils but maximally for those administrators involved in the discussion, can be clearly outlined. Change is threatening. It is one of the quiet despairs of my life as consultant to observe which heretics are thrown to which lions and to marvel at the fact that sometimes from month to month the roles are reversed.

It is perhaps in this sentence that I have defined the difficulty of the role of management in education since few educators have engaged in the analytic exercise which you have been so kind as to share with me.

THE PARTNERSHIP VOCATIONAL EDUCATION PROJECT

Ernest L. Minelli, Central Michigan University

Preface

A superior educational program today may be an inferior one a decade from now — unless bold imaginative steps to improve upon that program are continually taken. Today's failure to meet this challenge may very well perpetuate the "status-quo" rather than lead to improvements or to the fulfillment of the purposes of our secondary schools in the 20th Century.

Curriculum development, content, organization, and educational practices cannot be based on static or retired concepts. There must be a constant quest for imaginative research and development aimed at improving our educational programs and closing the gap between life and what is being taught in our schools.

Today, with the vast and accelerated accumulation of knowledge, no longer is it desirable or practical to teach isolated facts and knowledges. If our schools are to provide learners with meaningful experiences and understandings, knowledge must be organized in such a manner as to show the relationship of each experience or fact to the total experience. Concentration upon the acquisitions of concepts, rather than emphasis on specifics should be our goal.

Introduction

This is a description of a new program in Industrial-Technical Education designed to improve the quality of industrial-technical education courses, the quality of instruction, the articulation from one phase of education to another, and the application of knowledge through correlation of industrial-technical subjects with other academic areas.

Called the Partnership Vocational Education Project, the program functions on three levels - university, community college, and high school.

This total effort accentuates a committed cooperative approach involving Central Michigan University, selected partnership schools, community colleges, industries and their related associations, Chambers of Commerce, and labor. These groups were unanimous in their belief that real accomplishments would result only from a cooperative effort.

The design of the new program incorporated the opinions of Central Michigan University administrators and faculty, participating school administrators, and representatives associated with industry.

Underlying Assumptions and Changing Conditions

The new program was based upon the following assumptions:

1. That our rapidly expanding technology has created a tremendous need for skilled technicians and specialists trained to work with people and with modern machines as they serve as teachers, supervisors, directors, and consultants in the fields of industry, technology, and education.

2. That the problem of unemployment and the growing national problem of the teenager without a job provides a real challenge to our total society and calls for new ways of solving these problems by our educational institutions.

3. That success in a new kind of training for technological society will require a basic redesign in secondary school, community college, and university curricula which provides appropriate balance and relationship between the industrial-technical curricula and the general education curricula.

4. That a new approach to educating youth and teachers can best be accomplished through a cooperative partnership between the University, community colleges, the secondary schools, and industry.

The new Program also reflects certain beliefs held in common by the Central Michigan University faculty and the participating schools. These are:

1. That frequently there has been a lack of general education and professional experience to complement vocational experience in the preparation of vocational education teachers as well as a lack of industrial experience in the preparation of industrial arts teachers.

2. That vocational teachers often have not been given the opportunity to become familiar or work with the other disciplines.

3. That many school curricula offer few alternatives to college-bound students.

4. That high school schedules frequently have been so inflexible that course offerings have been limited and structured by this fact.

5. That too often school curricula offer little challenge to or stimulation for the underachievers.

6. That there has been a lack of coordination between the high school, the community college, and the university.

7. That students committed to vocational programs frequently get locked in, which, in turn, may result in a lack of general education.

8. That there is wide disparity between what is professed and what is taught in industrial-technical education.

Purposes

The basic purpose of this new program is to provide an industrial-technical educational program distinguished by the over-all high quality of the high school and college graduates prepared by it.

Supporting purposes are:

1. To improve the quality of and provide industrial-technical education programs designed specifically for the fulfillment of America's purpose and a changing world-of-work.

2. To provide occupational and professional guidance adapted to the individual competencies and special needs of students.

3. To engage a significantly higher proportion of capable high school graduates in preparing for careers in teaching or industry.

4. To better train high school graduates for continuing their industrial-technical training in college.

5. To make more effective use in industrial-technical education of modern industrial concepts, methods, and work-study internships in industry and the secondary schools.

6. To provide an orderly transition from the classroom to jobs or continuing development.

7. To develop retraining in-service programs for industrial-technical teachers in the schools.

8. To bring about changes in current secondary, community college, and university curricula necessary to the upgrading of industrial-technical training.

9. To develop a partnership relationship with schools, community colleges, industry, and the University in carrying out a total improvement program.

10. To provide "on-the-job" load-bearing internships.

11. To select and work intensively with a variety of schools in developing pilot demonstration centers.

12. To provide, through the University, continuing guidance to schools interested in designing new and modern programs of industrial-technical education.

Some Basic Characteristics of the Program

This is a plan for developing new industrial-technical education programs designed to train more and better qualified teachers and better qualified individuals for careers in industry, provide upgraded in-service education for teachers, and improve and enrich curriculum programs of industrial-technical education, both at the secondary and higher education levels. Changes will occur in current secondary, college, and university programs compatible with our 20th Century technological society.

Better industrial-technical education programs will result because this project involves a closer, cooperative relationship between the secondary schools, industry, and the University. Individuals preparing for teaching industrial-technical education and for industrial careers will be better selected because the project program begins with recruitment and counseling in the high schools. They will be better educated because the program provides a more flexible, individualized course of study. They will be better prepared to adjust to changing demands because the program provides additional and more suitable on-the-job experiences and contact with up-to-date programs.

To ease the transition from classroom to on-the-job performance, the project provides more field work and field trips, more work-study experience, and more contact with practicing professionals.

Leadership is provided to selected partnership schools to help them plan and initiate changes in the curricula of their secondary schools to better meet the challenges of our times and needs of our youth.

Industrial-technical education is a joint responsibility of the secondary schools, industry, and the University. A cooperative approach provides, not more of the same, but rather a different kind of practical experience-training, including more training under "battle conditions."

The new program emphasizes education for the present and future, beginning with the secondary schools and continuing through the community college and the University. Functioning at all three levels, university, community college, and high school, special emphasis is on an interdisciplinary approach interrelating industrial-technical education with other academic areas, namely, in the fields of English, physical science, and math.

Partnership high schools are concerned with curriculum development programs in industrial-technical education structured to provide for teaching the concepts that more realistically lead to a fuller comprehension of present-day technology and meet the job preparation or college specialization needs of our youth.

The new industrial-technical education programs provide experiences involving content not taught in other curriculum areas of the high school — involving an insight into and an understanding of the tools, machines, and industrial processes basic to our technical society. In addition, they provide for the discovery and development of technical abilities possessed by students. The academic curriculum of the high schools is being adjusted where needed to better supplement and strengthen the total educational experience of the student.

The high school program adequately provides for the basic instructional needs of 1) those students who may or may not enter the labor force after graduation; 2) those students planning to pursue advanced study and careers in an area of technology or applied science; 3) the reluctant or slow learner, the culturally deprived, and/or the prospective dropout, who will be entering the labor force before graduation or immediately after.

The project provides in-service education for the upgrading of secondary school teachers as well as supervisory and consultative services to partnership schools.

The community college program is aimed at providing maximum technological training augmented by an interdisciplinary approach. Transfer to the University is open if the student wishes to earn the bachelor's degree.

An updated University curriculum in industrial-technical education provides a five-year program leading to a bachelor's degree and a teaching certificate for teachers of industrial-technical education. Emphasis is on additional teaching and on-the-job industrial experience and on an inter-departmental academic sequence.

The plan provides students with a broad general education background, plus training in communication skills, human relations, research, and practical on-the-job experience in the secondary schools and in industry. The "on-the-job" experiences are load-bearing, paid internships in the schools and in industry. Key features of the plan include individually planned courses of study and an improved and better balanced curriculum.

Guidance is emphasized in the high school, the community college, and the University. The counselor helps the high school or college student plan a program suited to his strengths, weaknesses, and needs. Course requirements are designed to reach this goal.

Characteristics of the High School Plan

The high school plan is designed to offer students basic industrial-technical training leading to a fuller comprehension of present-day technology and employment procedures as well as stimulating them to continue their education in the high school, community college, technical institute, or in a four-year college.

The program is intended to appeal to all boys regardless of abilities and talents. Effort is made to allow for differences in abilities, interests, and needs, as well as afford learning experiences which are most significant for the success of each individual. For some, successful achievement because of the vocational interest of the student may be the motivating force for continuing school.

The industrial-technical courses have their content cast in science, mathematics, and English. The natural relationship of each subject to the others is drawn out and used for augmenting knowledge and for the constant reinforcement of the relationship between the vocational and the academic subjects.

Therefore, interrelationships between subjects is an integral feature of the program. The program fosters experiments, research, exercises, and opportunities for solving various types of technical problems.

Teaching teams, television, radio, electronic tape, excursions, self-teaching, teaching machines, and internships are all-important and are special features of the program.

In the ninth or tenth grade, the program consists of "The Study of American Industry." At these grade levels it is hoped all boys in school will see and experience the unity of wholeness of modern industry. Opportunities to study the underlying functions of industry and explore their interrelationships are provided. No attempt to group students by ability levels is made in these grades.

During the eleventh and twelfth grades the program consists of a two-year sequence of four major courses in the subject areas of English, science, mathematics, and industrial-technical education. Students take courses in these subjects as a group, but mix with the rest of the pupils for other courses normally given in these grades.

The natural relationship of each major subject to the others is drawn out and used for constant reinforcement. The interrelationships between the subjects are taught as an addition to the objectives of the courses themselves. Team teaching is an integral feature of the program. Teachers from the four major subject areas function as a planning team to organize the content and evaluate the students' work.

In order to accommodate ability differences among students, a three-level program is followed when deemed desirable. The advanced level accommodates the college-bound upper ability group. Graduates from this group provide recruits into teaching and for advanced study and careers in an area of technology or applied science. This could occur either through immediate enrollment in the University or by community college transfer.

The intermediate level accommodates those middle ability students who may qualify to enter the labor force after graduation or qualify to enter the community college or the University.

The lower level accommodates the lower ability group of students who are not necessarily college caliber and who will enter the labor force before or after graduation.

No student is permanently locked into any of the three-level programs if a shift to another program better meets his needs. The program at each level uses the vocational interest of the student as a motivating force in leading to a sound educational program, but the vocational interest does not result in an educational dead-end.

Characteristics of the Community College Program

In the partnership community college and/or technical institutes, the training program is designed to give the student proficiency in his selected field of technology, augmented by mathematics, basic sciences, English, and technological principles relative to his selected field. Upon graduation the student will be able to communicate mathematically, scientifically, and linguistically. In order to provide proficiency in these areas, and more meaningful experiences to the student, an interdiscipline approach is used. The major disciplines involved include the areas of English, science, mathematics, and technical education. As in the pilot partnership high schools, the natural relationships of each subject to the others are drawn out and used for constant reinforcement. The interrelationships between the subjects are taught as an addition to the objectives of the courses themselves. The remainder of the students' program of work is given over to meeting graduation requirements.

While many of the students in the participating community colleges and/or technical institutes will probably seek the two-year Associate Degree, transfer to the University is open to them if the student wishes to earn the bachelor's degree.

Characteristics of the University Five-Year Plan

Under the University Five-Year Plan, students have considerably more internship teaching experience than the students in typical industrial-technical teacher education programs. In addition, on-the-job industrial internship experiences are provided.

The first two years are spent on campus in a program especially suited to the needs of each student and the challenge of our times. The remaining three years consist of alternating semesters of on-campus on-the-job internships.

The major part of the University program during the student's freshman year is made up of a two-semester inter-departmental sequence. This major inter-departmental sequence includes the subject areas of English, physics and chemistry, mathematics, and industrial-technical education. Students take these subjects as a group, but mix with other college students for additional courses taken during each of these semesters. The interrelationships between the subjects are taught as an addition to the objectives of the courses themselves. Instructors from the four major subject areas function as a team to organize the content and evaluate the students' work.

The second year is devoted primarily to general and specialized education. In the alternate semesters, during the remaining years on campus, general and special education continue to constitute a large proportion of the student's program. Courses in professional education are also completed during these semesters.

During the student's last semester in college, he is enrolled in an independent study dealing with "The Study of American Industry." A team of University professors from the curriculum areas of sociology, economics, commerce, and industrial education serve as advisers and help plan and evaluate the student's research. The study includes structure involving the underlying functions of industry and their interrelationships, the unity or wholeness of modern industry, and a completed product.

In each of the three off-campus semesters, the student both learns and earns as a full-time intern of a selected partnership school or industry. The student interns for two semesters in a selected school and one semester in a partnership industry. His first experience is that of a teacher assistant in a public school, the second in a partnership industry as a learner and employee. The last is as a teacher associate under close University supervision in one of the partnership schools.

In addition to the three semester internships, the student spends one ten-week summer full-time internship both as a learner and employee in a partnership industry.

Characteristics of the In-Service Crash Program

Under the new program, extensive in-service education is provided. Teachers of industrial-technical education participate in seminars and take other appropriate University courses especially suited to the teacher's needs and for the upgrading of each participant. These seminars and courses are taught by selected faculty members of Central Michigan University in regional centers or on campus in late afternoon, in the evening, on Saturday, or during the summer session. In some cases, where desirable, individuals from industry are used to supplement instruction.

Another important feature of the Crash Program provides for an industrial internship where the participating teacher both learns and earns as a full-time paid employee in a selected partnership industry. The participant is placed in a goods-producing or service industry related to his teaching area of specialization.

Participants of the Crash Program may earn credit toward a mater's degree. The amount of credit depends on the quantity and quality of the work completed.

Evaluation

Evaluation procedures are pointed toward measuring the effectiveness of this new program in meeting the present-day preparation needs of teachers and labor market trainees. The evaluation plan has been kept flexible in order to make it pertinent and applicable to the action demonstration concept on which this project is based.

In Summary

Believing that the educated citizen is an integral part of our rapidly expanding technical society, the Partnership Vocational Education Project takes as its major objectives the organization, fostering, and support of a program of education that will encourage and enable all boys to attain an education commensurate with their abilities, aptitudes, and interests.

This Project, we believe, will establish the following:

1. Improved articulation between secondary schools, community colleges, technical institutes, and the University.
2. An all-university approach to industrial-technical teacher education.
3. Cooperative partnerships between the school, industry, and the University in educating our youth.
4. Greater application of team planning and team teaching.
5. The team idea application with reference to independent study.
6. The concept of more meaningful application to learning among all school disciplines.
7. An extension and a broadening of the base to the concept of "learning by doing."
8. An extension and a broadening of the base to the concept of "earning while learning."
9. A basic redesign for the secondary school, community college, and university curricula which provides appropriate balance and relationship between the industrial-technical curricula and the general curricula.

10. Programs that will accommodate various curriculum patterns in the secondary schools.

11. More effective use in industrial-technical education of modern industrial concepts, methods, and work-study experiences in industry and the secondary schools.

12. A more orderly transition from the classroom to jobs or continuing development.

13. Closer relationships between industrial-technical teachers and those from other disciplines.

14. An upgrading of industrial-technical teachers.

15. A sharing of the uniqueness of the immediate application of theory and practice as now used in industrial-technical classes with the English, science, and mathematics classes.

16. A sound secondary education for the vocational student, one where the vocational interest does not lead to an educational dead-end.

17. School curricula with more alternatives for the college-bound student.

18. A significantly higher proportion of capable high school graduates preparing for careers in teaching or industry.

19. Improved industrial-technical education programs to better meet today's needs.

20. Occupational and professional guidance adapted to the individual competencies and special needs of students.

21. Guidelines for planning new building facilities and for equipping the industrial-technical laboratory.

HYPOTHESES FOR - THE PARTNERSHIP VOCATIONAL EDUCATION PROJECT

Hypothesis I

Students in the Partnership Vocational Education Project will show educational growth equal to or greater than students of comparable age and educational background. (Results of standardized achievement tests)

Hypothesis II

The Partnership Vocational Education Project will meet the needs of individual students better than a conventional program.

1. Attitude study
2. Interest study
3. Student interviews
4. Dropout study
5. Follow-up study

Hypothesis III

The Partnership Vocational Education project will develop greater teacher morale than a traditional program.

1. Teacher opinionnaire
2. Teacher interviews
3. Administrative interviews

Hypothesis IV

Quality of instruction under the Partnership Vocational Education Project is greater and maintained at a higher level than under a conventional program.

1. Teacher opinionnaire
2. Professional growth data
3. Classroom visitations

Hypothesis V

Better utilization of physical facilities will be made under the Partnership Vocational Education Project than under a conventional program.

1. Utilization of space in the physical plant
2. Teaching aids developed and purchased
3. Evaluation of the physical plant
4. Classroom visitations

INTERDISCIPLINE PROGRAMS IN VICOED
(Visual Communication Education)

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Visual Communication Education

Visual Communication is the process of understanding and being understood through the sense organs of sight. It is one of the most vital forces affecting our daily life, our world of commerce, our industrial economy, and our way of transmitting knowledge and aesthetics. Visual Communication encourages extensive literacy which makes possible the systematic subdivision and analysis of knowledge, but also individualism as a social preference and possibility, marking the basic difference between tribal and civilized man. A truly literate person is one who is accustomed to the inner translation of sight into sound and sound into sight. This translation is a complex activity causing psychic withdrawal, a weakening of sensuous life, and a considerable lessening of the power of recall; but, it produces an analytical mastery of specific areas of knowledge enhacing the sense of the individual, and fostering the inner dialogue or conscience, which we rightly associate with the very citadel of civilized awareness.

Visual Communication dominates our world. By and large, the world's population, even the educated portion thereof, is illiterate in the use and implications of graphic materials. People have not been taught to see to the same degree as they were taught to speak, read, write, and figure. Most people still primarily depend upon the accident of unplanned and unstructured experiences in relation to seeing and understanding what they see. Therefore, it is of vital importance to improve perception so as to obtain a better grasp of the visual world and to interpret and communicate more effectively through the visual medium.

General Objectives for the Pilot Programs

A. To prepare the student to be knowledgeable in:
   1. the methods of communicating ideas;

2. the techniques of graphic representation;
3. the techniques of graphic presentation;
4. the principles of graphic information reproduction; and,
5. the principles of psychology, sociology, anthropology, education, economics, physics, chemistry, and mathematics as applied to visual communication.

B. To aid the student in developing a better understanding of, and the ability to cope with, the complexities of automation and the rapidly changing visual communication technology.

C. To aid the student in keeping abreast of current research and developments concerning visual communication.

D. To aid the student in developing the basic skills in the planning, preparation, and production of visual information materials such as: brochures; posters; proposals; presentations; slides; films; the management of visual materials; and above all, understanding how materials can be prepared to communicate more effectively.

Specific Objectives for the Two-Year Technology Program

A. To prepare the students for occupations as technicians or junior management in such fields as advertising production, graphic design, commercial and industrial photography, motion picture and television graphics, printing and publishing plant control, and many similar types of occupations in the visual communication industry.

B. To provide the student an opportunity for vertical concentration in one of the following visual communication areas: photography, professional writing, industrial graphics, graphic design, or graphic arts.

Specific Objectives for the Teacher Education Program

A. To prepare teachers competent to instruct in the visual communication area in the high school and the junior college or the community college.

B. To aid the student in developing the ability to solve communication problems by: studying the material to be communicated; considering the audience to be reached; reviewing known methods of information display; selecting the medium or media for transmitting the information; determining the audience reaction to the information; and, insuring that the medium or media selected will be utilized with optimum effect.

Transfer to the Teacher Education Program

Should the Two-Year Technology student decide to transfer to the Teacher Education Program for a concentration in Visual Communication Education at the end of his two-year program, the following will be required in his junior and senior years:

The General Education courses not yet completed;
The VICOED courses not yet completed;
The Professional Education courses; and
The State History requirement.

Art In Vicoed

Let us think for a moment of the fact that we as human beings are something of a strange admixture of biology and experience. All that exists in our knowledge of ourselves and our relationship to our environment we have learned by experience. The interpretation of this experience is, of course, shaped by our own intellectual and emotional capacities which have been developed by a long and complex pattern of previous incidents.

This should give us some concern when we consider that only a minor part of our experience can be real and immediate, where we can make of it what we will. The major portion must be vicarious and seen through someone else's eyes. So we find ourselves endeavoring to learn from the experience of someone else who has shaped the information in his own process of perception and whose communication is perhaps influenced by a variety of motivational factors.

This forces us into a type of conformity, whether we realize it or not, where we join together to seek information from sources which possess similar backgrounds and similar concepts of communication. We seek out those whose ideas strike a familiar chord within us and we are invited to think in a way which we are accustomed or in a way which we would like to become accustomed. We find ourselves in the position of being somewhat dependent on these sources for the major portion of our information. So it is with culture. The gradual building of information on information developing an intelligence to comprehend the new—thus leading the professionals to the frontiers of knowledge which gives research and experimentation justification and purpose.

What seems highly relevant at this moment is the possible chaos produced by incompetent communication. In our age when technological developments proliferate publication and circulation, we must have concern, not only for the accuracy of information, but concern for its transportation and its comprehension as well. This places rather a strict charge of responsibility on all who

He receives a good deal of help from other fields. The psychologist has helped him understand perception and persuasion; the sociologist has helped him understand something of the nature of people; the printer has helped him by being able to reproduce or represent any image he can create. The fact remains, however, that he is very much alone to face the terror of the blank page. His ally, the writer, faces a similar problem. Together they must provide the various marks for the page that will, at sometime, give record and testimony for something as complex and mysterious as mans' thoughts.

Chemistry in Vicoed

The inclusion of the sciences in a visual communication program is twofold. First, and most obvious, a background in the sciences is necessary to understand the evolving complex instrumentation being developed in the area of visual communication. The second phase, of course, is the ability to communicate what is happening in our technological world to the man in the street. From the earliest beginnings when man was scratching in the sands and creating cave drawings, he was trying to order his universe, he was trying to give it some sort of representation which he could transmit to his neighbors and friends. Unfortunately, his beginning efforts were rather crude. Much of it was guesswork which, of course, led to superstition, which then led to erroneous representation of the true event, which eventually then led itself to deceit, hate, mistrust, and eventually, wars. The ordering of his universe was essential for man if he was to survive on this planet.

With the advent of the Greeks, the science age was probably in its beginnings. For example, we may point to discoveries of Archimedies, Euclid, and so on. This was the age of science and seed of science had been planted. I believe from that point on the affairs of the world were, in general, set by the pace of science and the following technological developments.

Let me illustrate this. The greatest boon to communication was, of course, the printing press. But before the printing press could hope to survive, one had to have some basic understandings of paper chemistry (although it was not known as chemistry in those days), inks, dyes, mechanical advantages, and so on. With the advent of the printing press and allied techniques, the pace quickened, because written words and picture representations travelled about much further and could be read by many. Ever since this time, the pace has been increasing much more rapidly.

For example, after the printing press the greatest secondary contribution to visual communication would be photo-chemistry; that is, light sensitive silver salts. The transmission of information became even more rapid and accurate, since instead of an artist's representation, one had an actual photograph of the participate in its production. Modern communicators are indeed aware of the problem of individual perception and comprehension and are aware also of the need for complex information being accurately and efficiently transported. This awareness has produced new concepts concerning working procedures which involve a team approach.

The artist-designer is one who must answer this charge of responsibility, for it is his task to create or compose the various elements involved into some integrated form through which ideas are communicated. His effectiveness in visualizing and symbolising content will greatly influence its comprehension.

A part of his work which is increasing in its importance is his functioning as a member of this visual communication team. This team meets to discuss and analyze the problem of communication. Its membership is determined by the nature and gravity of the problem. Often technical complexities are encountered which require consultation with specialists in the field concerned.

The artist's role in this team is a vital one, for his work as a designer involves illustration, typography, and composition. His knowledge of these elements with their inherent advantages and limitations, tempered by the understanding of how they work together, make his contributions extremely valuable.

Due to the widespread circulation of publications and his own professional journals he is familiar with the various concepts of design and their regional characteristics. He is familiar also with the work of the more notable designers throughout the world. He is not only aware of the existing conventions concerning design, but the factors which have created them and what will create new ones. He has an understanding of how the contemporary images of fine art are in fact creating culture, and how this will in time influence the accepted conventions of graphic design.

What is perhaps most important is that he can call from this background that which is relevant to the problem at hand. Intention and content will dictate design but in the final analysis the design does shape the information.

When the artist begins his work of designing, he has a clear understanding of the relationship between intention and content. He will endeavor to maintain a keen balance between these for he is aware of how they can affect one another at the expense of comprehension.

Although the problem has been minutely defined, the task before him is not an easy one. He must be a master of the technical aspects of his work so that he is free to pursue ideas. His is a search for the appropriate imagery at the appropriate level of sophistication. He must be able to work without the fetters of self-doubt or technical inefficiency.

subject to be investigated. And so, the progress of science enhanced the pace of civilization and hence, the pace of visual communication advanced at an even more rapid pace.

As a result of this communication, man was confronted by two problems. He was confronted by more frequent and complex wars. Wars not only accelerated science and thus, accelerated visual communication, but also they took on a new aspect, one of which was secrecy. The problem of secrecy and communication of secret documents became a visual communication problem. Also, instructional aspects of the more complicated weapons of war, to be used by the masses, created another problem to be solved by visual communication.

But in addition to man's wars, he also began to work on life-saving processes. For example, the crusade against TB, utilizing visual communications available. Today we have an attack on heart disease, cancer, and the delicate problems of VD to the presently uninformed and unaware public.

Radio and TV were the third most important events which were brought into the field of visual communications. Take as an example, transatlantic TV of medical operations. We need competent people to direct such things as well as produce them. An understanding of the space program and the public relations that are being used by NASA are prodigious.

Thus, with the use of promotions, descriptions, pictures, abstractions, and so on, that is visual communication, we have promoted the world of science and the resulting technology to a point where, (1) we no longer understand the advances being made in science, since they have now become so extremely abstract that no one has the ability to communicate what is going on to contemporary man and, (2) science has been promoted to the place where the advancing technology is destroying the very environment of man he originally set out to improve.

Let me illustrate these points. First, for several centuries now there has always been a mathematics gap between the scientist and the mathematician (this is usually about 100 years) and little attention at all was given to the public comprehension. But this can be no longer tolerated in science or by the general public. Modern man must understand those essential subjects, if not in detail, then at least in substance. A clear example of this is the relativity expression $E=MC^2$. Albert Einstein, who developed this in the early part of the twentieth century, had no idea of its implications, but it soon became apparent that every man in the street needed to understand the relation between energy and matter with the advent of the atomic age. Furthermore, science is becoming more abstract, the theories of science and what they produce, for example, semiconductors, better known as transitors, or computor and automation, are very little understood by the public and clarification of what these things are . . .

how they affect us is essential. Secondly, I only need to point to our air, water, food pollution, fallout, and the ultimate situation, the total destruction of our civilization in a matter of hours. We, the total population, must be aware of these problems.

Surely, we need people to convey these complex technological problems to our mass audience. One might even be led to state that it will not be the scientist, engineers, humanist, politicians, or religious leaders who will solve these needs and potential dangers, but the people who present these complicated ideas and situations in a true and readily understandable form of visual arts if we are to stabilize a now teetering world.

But before an expert in visual arts can attempt this communication, he himself must have an understanding of the material he is about to relay to the public. There cannot be any room for erroneous representations. He must at least have a knowledge, a basic knowledge, of what he is about to convey. Not necessarily a complete knowledge, but a base to build on so he may talk to the scientist or engineer and then present to the public a true and accurate representation.

This then, is the need for the science in the visual communications program, to develop a very basic understanding of science and some aspect of engineering so that he may not only understand the workings of his tools, but also be able to convey readily understood scientific and technological information to a desperately information-hungry public.

Engineering Graphics in Vicoed

In establishing the relationship of industrial graphics and industrial design to the total visual communications project, it is important to recognize the variety of methods and techniques that man has devised to communicate through the visual sense. The use of the written word, the printed word, the photograph, the symbol—each with its unique capabilities and inherent limitations. To this list would certainly be added the media of drawing; drawing in a technical sense, particularly as it applies to the industrial aspect of our society. Drawing is the graphic language by which designers, engineers, technicians, and craftsmen translate ideas and theories into tangible goods and products. And as our products become more complex, and as the systems within these products become more involved, our capability to effectively communicate through drawing is indeed challenged. This becomes particularly realistic when one begins to examine the scope of engineering graphics and begins to realize the variety of communicative needs that are created by industry. The designer, the engineer, draftsmen, machinists, welders, tool designers, the tool maker, the purchaser of materials, facilities designers, coordinators, the inspector in quality control, packaging engineers, sales representatives, the individual servicing the product—and of course, the consumer—all with the need to communicate one with another, and all relying on some form of engineering graphics to accomplish this task. To satisfy the communicative need that exists herein and to develop the capacity for expressing our technical ideas in a clear and expeditious manner is indeed a challenge for industry—and for education. What then of the implications for education in the areas of engineering graphics and industrial design?

In the first place, it would appear that there is an urgent need to help youngsters appreciate and understand that drawing is a means of expressing and communicating an idea. This concept is, of course, one of the basic and long-established objectives of our drawing programs, but how effectively have we implemented this objective in the traditional approach to drawing and graphics? Have we labored expressively on techniques and the development of manipulative skills to the extent that youngsters seldom have the opportunity to use drawing in a truly communicative sense? In an approach wherein drawing becomes communication, the youngsters would seemingly be involved in design and problem-solving experiences; in the development of ideas and the representation of these ideas through graphic depiction. Such design problems could be for any number of industrial type products such as a keyless lock, a device for guarding the blade on a table saw effectively, a tool holder, a tooling problem, a locator for items in a supermarket, a packaging problem. Design problems could be related to household or architectural applications such as furniture, a room divider, an entry design, kitchen remodeling plan, porch canopy, or an outdoor lighting device. The problems may be community related —the design for a litter container, rural mailboxes, or street signs; or drawing problems may be related to other school subjects as well, such as producing drawings of a tetrahedron or describing in graphic form a simple molecular structure. It is anticipated that in such an approach wherein design problems become the basis for the student's drawing experience, the youngster will have had the opportunity to develop his capacity to reason, to make judgments, to solve problems, to think creatively, and to express his ideas through graphic representation.

Another area in need of improvement, from the standpoint of visual communications, is that of helping youngsters recognize the manner in which ideas are represented in different types of depictions. Do our students realize, for example, the communicative value and inherent limitations of orthographic depictions, of the various pictorial representations, of freehand sketching, of graphs, charts, and the like? Again in the traditional approach, we often are more concerned with teaching the mechanics of the process than with clarity of depiction. We teach youngsters to make an isometric drawing by manipulating a 30-60° triangle, but do we mention the realism or lack thereof, that is manifest in the isometric projection? Then too, have we placed sufficient emphasis on the concept that the type of depiction is dependent on the background or the needs of the audience to whom you are communicating?

One other recent development of industry that is destined to have a profound effect on the communicative effort of industry and education is that of computer graphics. The aim of computer graphics is to improve the directness with which the designer, the engineer, or the draftsman communicates, and each new generation of equipment furthers this aim. The capability to communicate graphically with the aid of computers is advancing rapidly and is going to be with us perhaps before we realize it and are ready for it. What then, should we in education be doing to prepare ourselves and our students for the implementation of computer graphics? To answer this, we should probably first recognize that it will be a while before schools can afford the equipment that is used in such systems. Nevertheless, we need in the meantime to begin acquainting youngsters with the potential that is inherent in this new-found technology. We need to begin teaching the fundamentals and terminology of computer operation and orienting our students to the concept of man-machine drawing. It would appear that drafting, as such, will play a decreasing role in the communicative cycle. As equipment is perfected, produced, and distributed, and as our use of such equipment expands, an ever-increasing proportion of our communication will be by some means other than drawings as we know them today. We must prepare students for this reality. At the same time, we must prepare them to accept those functions that will remain the unique responsibilities of man which would include creative thinking, human expression, design judgment, and the exercise of imagination. Are we stimulating and challenging these qualities in youngsters?

Economics in Vicoed

In discussing the development of and need for this experimental program, reference has been made to the training of a "new breed" of teacher. The need for the "new breed" has arisen from basic changes in the technology of communications. These technological changes have been proceeding on a limited basis of application for some time, but the accelerated pace of development in other areas has forced a rapid expansion in the capacity of the communications industry to transmit and make available in quantity the information necessary so that a bottleneck will not develop and impose constraints on the other areas.

To date, basic development and production industries have trained their own communications specialists, and we see a growing lag, or gap, between the development of new technical capacity in communications technology and its application due to lack of adequately trained personnel.

This program initiates what the economist refers to as an "external economy," the development of capacity outside the involved industries for training the personnel needed by the new technology.

As is true of most technical change, the early requirement is for modification in the skills of the operative personnel. This is readily provided by the affected firm. However, once the new technology has been proven, the demand for the technically trained personnel expands beyond the capacity or interest of the initiating firms to satisfy it. Not only does the demand affect the technical or operative group, but quickly invades the realm of production planning and management. This is especially marked in the communications field for several reasons.

First, communications has rapidly changed from being an external activity for the firm to that of an internal activity. The "communications" group of many large firms far exceeds the size of many traditional printing and publishing firms. In many cases the diversity of communications capabilities required far exceeds that of most independent communication plants. Internal communications has become a significant cost item. Technical change has reduced the proportion of persons who perform a simple operative function. Every worker now must make decisions which affect the efficiency and hence the competitive position of the firm. This requires a breadth of knowledge of administration and an understanding of production never before required of him. The rapid expansion of the internal communications activity creates an immediate demand for management and supervisory personnel—requiring both the technical capacity and understanding and management skills and capabilities. The traditional concept of the technical school is no longer adequate in this industry.

Second, all business firms operate in a market, therefore an understanding of how the market works—selects, rewards, and rejects—is important. The "product" of the communications industry is primarily a service—information. As such, it must meet the requirements of its "customer" as to adequacy, efficiency, convenience, and economy. As the environment and technology of its customers change, their requirements of the communications "product" change. The communications industry must anticipate the needs of its market and develop these new products. The market for the communications industry is not only an industrial market, but also a consumer goods market. The requirements of these two markets are different, yet in operation a knowledge of the one may be essential to satisfactorily meet the requirements of the other. Hence, the communications man must understand the elements of product development, production, and distribution.

Thirdly, the communications person must have an awareness of the total environment of which his industry is only a part. He must recognize that the market is dynamic. It is constantly changing, and successful performance requires an appreciation of this fact and a constant attention to flexibility and adaptation. An appreciation of this dynamism will allow the communications person to keep abreast of industry needs and make possible the exploitation of new potentials to the benefit of his organization, its customers, and the total society.

Here we might emphasize that the participant in market society carries a responsibility to this society which transcends his responsibility to the organization of which he is a member. He or his firm cannot accept the benefits without also accepting the responsibilities.

Finally, the production man as well as management in general, must be aware of the capabilities of the firm itself, and maintain its strength and efficiency. Control is facilitated by proper interpretation and use of external information. This information is provided by accounting and financial reports. Every decision, every modification of operation, every order accepted, is going to affect the firm's financial condition—costs will be affected, revenues will be affected, financial adequacy will be challenged. Since these results will be reflected in and must be analyzed on the basis of financial reports, the employee must be able to understand the language of business accounting. Certainly there is no place in the communications business for the non-speaker or the non-reader.

Expository Writing in Vicoed

To begin at the beginning: one picture is worth a thousand words, but too often we forget that behind every picture are ten thousand words of writing and discussion about what image is most appropriate to present a given concept. This area, the scene behind the picture, is the province of the writing courses in this program.

For the English department, this scene has two aspects, the aesthetic and the practical—the spill-over of rhetorical devices in image creation and the always present problem of teaching work-a-day prose that is clear, precise, and unambiguous. The second of these aspects, practical prose for memos, letters, instructions, needs little justification. The aesthetic aspect, however, is perhaps initially a bit startling. But it can be argued with some logic that the talents required to condense a complex idea to the point at which it can be summed up in a sequence of images are those used in assembling the elements of a story, an essay, or a poem. Indeed, a compelling visual, whether it be an advertisement or a mnemonic device, achieves its effects in much the same way that a poem works, abstracting from reality, ordering responses, and establishing values. Such is the source of the difference between a merely competent piece of work and one that is memorable. For these reasons the writing courses are not labeled "Writing for Graphic Arts Students." It has seemed appropriate rather to concentrate upon the corpus of rhetorical theory and practice, that repository of what is known about the complexities of exposition and persuasion.

News Writing in Vicoed

The student in this program has the option of taking either of two sophomore-level writing courses: Exposition or Journalism. Our purpose in these courses is NOT to train professional writers, but rather to give students an understanding of the elements of good writing so they will at least be able to distinguish the good from the poor—to know when a piece of writing does the job it's intended to do and when it does not. If the student is interested in additional writing courses, he may use his electives to take them. He may also follow his bent in the seminars in that portion which deals with writing. We have no illusions about making writers in a 3-credit course.

Secondly, we are attempting to show the relationship of writing to other elements in communication—to demonstrate how several of these elements may effectively complement one another. The latter, however, will be done primarily in the seminars which will be team-taught.

Essentially, the role of the writer—particularly the journalist—in the communications process is that of a translator. It is his task to explain and interpret the mass of complex happenings that plague the modern age—to give them meaning, since few people are comfortable and conversant in more than one or two disciplines.

In addition, as each of the disciplines becomes more specialized and technical, it develops its own language, much of which is understandable only to those who are members of the group. Hence, we do not have a single language with which we converse; rather we have a series of languages dominated by jargon, most of them meaningless to the great majority of people.

This, then, is where the writer in his role of translator steps in. He breaks apart the jargon and gives meaning and understanding to ideas, opinions, and events—to a body of knowledge that is growing at a tremendous rate each day.

Although words are not the earliest form of communication, they have been the very basis of communication for lo these many years. And often they are given additional strength by other media—pictures, illustrations, diagrams, and so forth.

This, primarily, is what we are attempting to do in the Project—to bring the graphic means of communication together in a common place, in a common curriculum, so they may work together; to enable students to see and understand relationships and learn how to use the communications tools that exist for maximum effectiveness.

Writing is but one of these tools, although it is a highly important one. In some instances, a good piece of writing will stand alone, that is, the words are so powerful, so meaningful, so emotional that anything added to them would be a distraction. Still, that piece of writing, regardless of how crucial it is, must be appropriately designed, printed, and distributed. Even working with just words requires more than a writer for those words to achieve the greatest impact.

The disciplines we have included in this visual education curriculum complement one another in the total program, just as the media complement one another. One of these—Good Writing—is an art not easily acquired, but we hope by the time our students graduate, with additional writing practice and instruction in the seminars, that their stock in the trade will be depression-proof. Recession, yes! Depression, no!

Graphic Arts in Vicoed

Notice the title again—Graphic Arts as a PART of Visual Communications. This is considerably different from thinking of graphic arts and visual communication synonymously. Before one can implement a graphic arts program for visual communication, it should be understood that this is not to be a euphemistic upgrading of the same old traditional printing programs which have been extant. With reference to this, some years ago many "printing" programs became "graphic arts" programs with nothing changed but the name.

The desired visual communication program differs from the traditional graphic arts program primarily by placing more emphasis on the conceptual approach and somewhat less emphasis on skill. This is not to say that skill is to be totally ignored but rather it should be somewhat reduced. The difference, and subsequently the success of the program, can come only through the efforts of the teacher. While it is quite true that a lack of hardware might handicap a program, it is more emphatically true that new hardware alone will not ensure the success of this or any program.

If a person is to go into the field of visual communication, he will need skills and knowledge which differ from those taught in the traditional program. This is the primary reason for the interdisciplinary approach used at Western Washington State College.

If a person can be educated along broad concept lines, he should be able to shift his manipulative ability in any manner dictated by technological change. In the area of graphic arts, the following phrases fairly well describe the broad concepts which the student should be taught:

1. Communicating with visual materials;
2. Idea visualization and designing visual information;

3. Reproducing visual information;
4. Presentation of visual information;
5. Managing visual information materials; and
6. The industry.

The skills needed and taught should be directed toward these goals and not considered as an end in themselves.

A primary reason for this is the present advanced and rapidly changing state of the art. It is quite conceivable that under the traditional approach we might train a person to operate a particular machine and by the time he is to be employed, that machine may be obsolete.

Another major reason for the shift in emphasis has to do with the process of retraining. In the past we have operated courses to retrain those who have become technologically unemployed. When these people return to a new position, they are there until such time as they become technologically unemployed again, at which time the circle starts again.

Now as to how these concepts can best be taught. A team-teaching approach could be either the best or the worst way to do it; best if properly done and worst if team-teaching is not properly understood and executed. In a team approach, various teachers might well be primarily responsible for different concepts. In a departmentalized arrangement, the subject matter might call for modification of material to include some of the major topics mentioned elsewhere in this issue.

The important point is not so much which way the course is taught, (although the team approach is generally desirable—if done properly) but rather to see that all of the material from the various disciplines is related. A new job or task falls the lot of the graphic arts teacher now—that of the relator.

To produce an effective piece, it is necessary to know many things about several disciplines. First, it is necessary to have a purpose and to select an audience. To reach the audience and have it react favorably, it is necessary to understand some of the sociological, psychological, and anthropological aspects of design and communication.

Next, it is required that one be able to visualize and design the appropriate material in a manner suitable for whatever form of reproduction or production is to be used. This consideration is in turn interdependent upon factors which may be economic or technical in nature.

Reproduction itself may be subdivided into four concepts including 1) conversion of design elements into reproducible form; 2) assembly of an image carrier; 3) effecting a transfer of image from carrier to transport; and

4) finishing. All of these factors are interrelated and in turn dependent upon decisions made in areas outside this major concept.

The point need not be labored further. The important thing is the interrelatedness of all of these areas. One of the major tasks of the graphic arts teacher is to provide an opportunity for concepts learned in many areas to be used in designing and producing visual communication materials. These interdisciplinary concepts, which are to form the basis for designing material, are all directly related to the media which will be used for presentation. The methods of presentation should be taught with a conceptual approach so that as machines are changed the person primarily responsible for production will be able to modify his own skills and remain as effective as he has been.

Photography in Vicoed

Photography and Audio Visual. Why are these disciplines included in our Visual Communication program? In the case of these two visually oriented fields, the answer is self-evident. Photography, for example, is one of the major methods of recording visual images. Audio Visual is the name given to the field which deals with the preparation and use of audio materials and visual images. However, even though the answer to the question of "why include photography and audio visual" may be self-evident on the surface, the very ease with which we can make this assumption can obscure the real importance of these disciplines to our program.

To treat photography and audio visual as mere producers and image users is to partially negate our basic concepts approach to the field of visual communication. When seen from the conceptual point of view, these two disciplines become very important indeed to the whole area of visual communication—and become interwoven into the fabric made up of threads emanating from all the other disciplines in the program.

Photography is not only important to those of us working in the field of visual communication because it has been termed a universal language. Its real importance lies in the fact that it is a language. Our broad-base approach to the entire field of visual communication demands an approach to the teaching of photography which not only includes information on how to produce the photographic image, but also information on how photography is used as a medium of communication. In fact, the latter use of photography in this curriculum is far more important than the former. We feel that the study of photography as language will enable us to become somewhat more accustomed to perceiving relationships between areas, objects, and ideas.

This same approach must also be used for the audio visual field. I dislike the term "aids" when tacked to "audio visual." The term "aids" somehow gives the teacher the idea that audio visual is something attached to the main educational process . . . a frill . . . something extra. Recordings, films, slides, charts, displays—all of the things which make up the area of audio visuals should be fully integrated into the lesson plan of a teacher. A slide is a communication medium just as a word is. I believe that there is a "best way" of utilizing a visual in a given situation in the same way that there is a "best word" for portraying an idea in a sentence. Proper use of visuals, for example, require understanding of the concept of visual language and the differences between the means of presenting the visuals, just as an understanding of language and vocabulary is necessary before the teacher can deliver a lecture that makes sense.

The type of presentation or type of reproduction of visual media is an integral part of the entire process of designing a visual communication. The coordination of the audio with the visual is extremely important to some forms of presentation. Therefore, audio visual is an important part of our curriculum. It involves considerably more than learning to run machines.

Photography and audio visual must be a part of the visual communication program. Both provide a "showcase" for utilizing knowledge acquired in the other disciplines, and both contribute knowledge which may be used by the other disciplines.

Physics in Vicoed

Physics is one of the most operational of the sciences. By this we mean chemistry, for example, is a science of processes—chemical reactions, changes in properties of substances. Physics on the other hand is more concerned with how things work—physical changes they undergo rather than processes which evolve from them. Physics dates back to the time when the wheel, or the lever, or the screw was first invented and has set the pace for modern technology ever since. Without the advances in physics, chemistry and its sister sciences would not have flourished as well as they have. Physics has marched from country to country and with it the economic and cultural values of that country have risen. One only need note that during the turn of the century the most predominate fields of physics study were in the countries of France, Germany, and England. However, at the end of World War I these countries were so bled white by the conflict that the physics of the world marched to other countries, and with this marched the scientists themselves.

The exodus of the physicists of Europe to the United States and some to the Soviet Union marked the beginning of high-level politically oriented physics in both of these countries. It also marked the beginning of rapid economic and cultural advantages.

Therefore, it is essential for the visual communication major to understand, if not in detail at least in principle, the basic operational procedures of the world of physics. Physics is classically divided into several divisions. First, and probably the most important to those utilizing machines, mechanical advantages, and so on, is the world of mechanics. It is essential for the person dealing with modern technological machines to understand the basic concepts behind mechanics, energy, and work. The second classification of physics has usually been heat and light. Although heat is not too important for the person in visual communication, light is of the utmost value. It is the means by which any form of communication is transferred from an inanimate page to the living mind. Light, color, and more important, geometric optics are probably the most fundamental tools of the visual communication expert. It is essential that he have a basic understanding of mirrors, lenses, spectrums, colors, gradings, and intensities of light. The next classical division of physics is that of electricity and magnetism. Many processes today in the visual communication areas depend on electrical and electronic, and to some degree magnetic, properties of matter. It is essential, therefore, that the student majoring in this area be familiar with the concepts and effects of electricity and magnetism and its sister science, electronics. Last and most recently, the fourth division of physics is that of atomic and nuclear phenomenon. Even though a visual communication major would not be concerned with the very fine details of atomic and nuclear sciences, one cannot deny that in communicating with the public he must have some basic understanding of the basic concepts. For example, if he is to communicate by means of a civil defense pamphlet to the general public the aspects of fallout, he must himself understand not in detail but basically, what fallout it.

In addition to relying on these four fundamental divisions of physics, new areas have developed. The area of plasma physics; that is, the physics of electrically charged matter, is having very important effects on industry and hence will have important effects on the public. One need only mention the laser which is a development out of the branch of optics and is becoming a very important means of communication, especially as the space program develops further and objects transmitting information are farther removed from the planet earth. The visual communication major must at least have a background in optics to understand the processes of the laser.

Solid state physics with its numerous transitors, transducers, semiconductors, and computer-electronics are at the forefront of technological advancement in today's world of physics. To understand all these things is a monumental task. But one needs only to have the essentials of physics to do this. He must have this for two basic reasons. First, physics is very much involved in the equipment in which the visual communication major works—computer-graphics, color photography, radio, television, and other electronic devices. He must understand the principles behind these if he is to utilize and advance the technological potentials of visual communication. Secondly, besides knowing basically how his equipment works he must be able to communicate to the modern world on modern subjects. It is essential that the general public be informed as to new developments in the world of physics, for that matter, in the world of all the sciences. It is essential for him to understand the aspects of automation, computers, solid-state electronics and so on—not in detail but what they do and how they work in a simple, descriptive, and yet concise manner. This is the job of the visual communication expert and he must have physics if he is to explain these things to others.

Furthermore, politics and the world of physics have been involved very strongly since the end of World War I. The Congress of the United States has been more or less mesmerized by the physicists. We must remove this aura of mysticism from physics and present it as a human endeavor, which it actually is. We must relay to the public, to the politician that physics is not a mystic science but can be understood in principle by everyone and to do this you must be able to communicate with the expert physicists and relay the information concisely, accurately, and descriptively to the general public. Furthermore, in order to be able to comprehend and digest future advancements, which undoubtedly will come to pass, you must have the basis on which to build. We hope to provide this in the basic introductory courses which will be offered in the visual communications program at Western Washington State College.

Psychology in Vicoed

It is obvious that psychology plays a fundamental role in a program of visual communication once the aim, communication of ideas, has been accepted. Rather than attempt to discuss in an abstract manner "why" psychology is in such a program it would seem more useful to briefly describe some of the aspects of psychology which relate clearly to visual communication and which will be built into the curriculum.

Selection from the vast quantities of psychological knowledge which have obvious relationship to Vicoed is one of the greatest difficulties. A review of a recent volume of one journal, The Journal of Applied Psychology, revealed the following topics which had received treatment and had relevance to visual communication: the effect of intermittent illumination on perception, subliminal perception, paint characteristics and discernability, road sign as communicators, color coding, cigarette images and personalities of smokers, and letter differentiation.

Let us classify some of our proposed areas of study under two major headings: perception and problem solving. Needless to say, other areas such as learning, motivation, and sensory function will be included in the curriculum.

The well-established fundamentals of perception form a cornerstone of knowledge in our understanding of visual communication. Fortunately, most of the studies have been done in the area of vision rather than with the other senses. Included here are the physical characteristics of the visual stimuli which aid us in recognizing a specific object such as: contrast, continuation nearness, and margin. Also included are the characteristics of stimuli which determine to which of the competing stimuli we respond, e.g., movement, size, and intensity. In addition, some study of the visual apparatus and how it functions would be incorporated into this curriculum.

At more advanced levels the student would study selected topics which can be considered a part of the general field of perception. Advertising provides one large field for applied scientific research (as well as an even larger collection of beliefs which must be given intensive critical examination). Another well-developed field of study in which a great deal of factual information is available is concerned with the legibility of print.

Further examples, which include as yet untested ideas as well as developments for which substantial evidence has already been accumulated, can be enumerated. Motivational research and subliminal perception are two which have received a good deal of public notice in the past few years. In both instances, non-critical reports suggest that powerful and effective communication tools have been proven. Although both have received some scientific attention the crucial point is that the education of a visual communicator should provide him with a background enabling him to readily recognize the difference between the claims of the enthusiast and the findings of the careful scholar.

From the area of social psychology comes reports of the relationship between the credibility of the information source and the degree of effect the information has upon the receiver. Recent intensive research upon man as a receiver of information reveals that on the input side he is essentially a "one-channel" receiver. The added value of a two-channel input, such as television, comes from the fact that he can "choose" which channel to employ. Experiments indicate that if the input is at a much higher rate than we normally experience, the receiver is likely to either listen or look—not both simultaneously. The person will literally cover his eyes or his ears to improve his hearing or vision. It takes a fraction of a second to shift from looking to listening and, if the input is intensive enough, he cannot afford this transition time. There are individual differences as to whether vision or hearing is best for a particular task. Human engineering perhaps best labels this area of study which needs to be understood by the visual communicator.

Regardless of the fact that the typical student has considerable scientific education, he rarely learns of the difficulties of research in behavioral science unless he takes special work in psychology or sociology. Every individual has such a tremendous wealth of information about humans that it is difficult to bring him to appreciate the value of the laborious procedures of science. Fortunately, examples such as perceptual illusions, common disproved superstitions, and the body of scientific evidence concerning advertising which has now developed, can all be used to demonstrate the importance of this approach to the accumulation of data.

Also, vital to problem solving is a knowledge of where to find appropriate scientific information. Psychology encompasses tremendous amounts of related information and one must be taught how to retrieve it from the literature.

Finally, a substantial number of specific techniques for solving problems in visual communication should at least be introduced to the student. As one example, he should know measuring instruments such as the Semantic Differential which allow the researcher to study the image or meaning of any word, phrase, picture, or concept as well as to measure attitudes toward these. From this kind of study there emerges specific information concerning the value, potency, and activity level of the concept in question. The value of such information to the communicator who wishes to employ any particular word, symbol, picture, or phrase is obvious.

Soc-Anthro in Vicoed

It requires no special pleading to get authorities in visual communications to agree that a knowledge of the behavioral sciences is requisite in their training. In much the same fashion, it is quite possible to get politicians to agree that sin is bad and virtue is good. The difficulty arises in implementation.

In fact, most individuals trained in visual communication techniques possess very little knowledge of the behavioral sciences, with the result that much of our efforts at communications are fuzzy and some downright disastrous.

We need to impart an overall understanding of what we currently know about human behavior in individuals and in groups. That being so, instruction in the behavioral sciences for visual communicators should not be fragmented into the several disciplines of psychology, sociology and anthropology but, rather, should be presented as a whole. This in turn means that the majority of practicing behavioral scientists should not be utilized as instructors because they are highly specialized. What we require in an instructor for this program is an individual who is well-read in all of the behavioral sciences and has an ability to convert this knowledge to rules and guidelines for understanding and predicting human behavior. The visual communicator in training requires an overview of human behavior plus sufficient sophistication in sources and research techniques to locate and understand special data in the behavioral sciences which he might require.

Suppose the visual educator has a task of preparing a half-hour television documentary on pre-school training in reading directed to young-marrieds and that this program is to be sponsored by a soap manufacturer who will insert four minutes of advertising in the thirty-minute span. Among the types of data and understandings which the visual communicator will require from sociology and anthropology will be the following:

1) The median age at marriage in the United States in 1900 was 26 for men and 22 for women. The median age today is 22 for men and 20 for women. Furthermore, the average couple produces a child twelve months after marriage whereas it was almost two years in 1900. Thus, the very phrase "young-marrieds," used with reference to child-rearing, refers to a much younger group than most generally educated people realize.

2) On the other hand, the young-marrieds will be far better educated than most advertisers and documentary writers appear to realize. The average today will have gone through high school, and a substantial minority will have had one or more years of college. Thus, the myth that documentaries in advertising should be written for a 12-year old mentality is just that—a myth.

3) Is this documentary designed for all social classes in the United States? Probably so, since the advertiser is engaged in selling soap. In that event, it has to be borne in mind that various social classes in the United States have wildly different bathing habits. For example, a member of the professional upper-middle-class says that he bathes once a day, believes this, and in fact bathes about five times a week. Many dwellers in the slums of our large eastern cities do not number a bathtub or shower among their possessions, though virtually all have access to one or more television sets.

4) In the course of the documentation, it is quite necessary to remember that upper-middle class parents place far more emphasis upon the pre-school child's ability to read than do lower-class parents. However, upper-middle class parents are far more susceptible to teacher pressure not to teach the child to read until he enters school. Thus, in many a middle-class home, there is struggle centered around the subject of the documentary. Lower-middle-class parents are frequently unaware of the controversy, but maintain an environment far less conducive to pre-school reading. Lower-class famılities rarely have books in the home and rarely watch documentaries of this type in any event.

5) If the perfumed and/or sensual character of the soap is to be emphasized in the advertisements, then the documentary should be aimed at those hours when women dote over the television set, i.e. late morning to mid-afternoon. If this be true, then the documentary must be written with mothers, and not fathers, in mind.

6) If the advertiser wishes to tap markets that do not purchase much soap, it may be well to center upon minority and disadvantaged social groups, which will require a whole set of specialized knowledge concerning the taboos and usages of the minority group to be pictured.

7) Is the documentary designed for export? That is, will it be shown on Canadian television and perhaps on British Broadcasting Corporation "telly?" If so, you have to deal with the fact that Canadians and Englishmen marry later than do Americans and produce fewer children and later (except for French Canadians where the reverse is true; however, since the program is presumptively being prepared in English, it will not be viewed by les Canadien).

8) If intended for a British Commonwealth audience as well as American, one also has to remember that, compared to American families, English parents tend to place more emphasis upon learning at younger ages but that English children leave school earlier than American children do. The English-speaking Canadian family will stand about midway between the English and the American in these regards.

9) The whole question of when and how a child ought to be taught to read is now (and has been for the past thirty years) a subject of heated argument among educators and of much criticism directed against professional educators by the laity. How does the visual educator propose to handle this problem? Is it his purpose to excite interest by discussing the controversy (in which case only the cognoscente will watch and not much soap will get sold), or does the visual communicator propose to deal with the subject as if there were one technique only. In the latter case, whose technique is he going to employ and why?

10) A number of larger soap companies are international in character and are interested in expanding their sales in the non-English-speaking world. However, if this documentary is designed for use in the Latin American or African market, the communicator has to be aware that the majority of the population do not have access to a television set and do not purchase commercial soap. If the program is to be aimed at the upper-middle-class in Latin America, then a quite different set of taboos and habits with regard to bathing must be considered.

I stopped at (10), not because we have by any matter of means exhausted the considerations that a behavioral scientist might raise with regard to this half-hour program, but because ten seemed a good round number and I trust the point has been amply made. In the past, those charged with the responsibility of communicating with the general public have usually assumed that the people they are communicating with are very much like themselves. This rule will work provided the population communicated with are of the same nationality, social class, sex, region, educational level, and intelligence of the communicator. However, usually we wish to contact a much broader audience than this. Furthermore, in a growing number of cases, we want to contact a special population to which the communicator does not belong. To give only a few examples of this latter statement, the astonishing rise in buying power in the teenage set, among American Negros, and the influx of Puerto Ricans into our eastern cities have all created markets for goods and ideas which involve the need for special understandings and techniques in communication.

Finally, a few observations upon the social responsibility of the communicator. The rise of the mass-communications media is overwhelmingly a product of the 20th Century and most especially of the last generation. To drive this point home, almost all of the readers of this article can remember when the first television set was brought into their homes. However, the median in America today is 28 years and that median age will go down a little in the next few years. That means that within your working lifetime you will be dealing with an audience which has, in the main, no memory of a time when most of their entertainment and news of the outside world did not come from the one-eyed monster.

Television and, to a lesser extent, radio have thus come to have an awesome and hitherto unexampled power to disseminate group culture and also rapidly and effectively to alter group opinion. The degree to which we raise the aspirational and intellectual level of the American and later the world populace by intelligent utilization of visual communications techniques shall be one of the most important yardsticks for determining whether our civilization can survive. Up until now we have treated visual communicators as technicians who require training in the graphic arts and little else. It was Clemenceau who remarked that war was much too important to leave to generals. The daily entertainment and intellectual fare of the population is much too important to leave to narrowly trained technicians. Tomorrow's world must be recorded, explained, and explored by some of our most sophisticated and intellectual citizens. That's what this Vicoed Ford program is all about. We cannot produce such exemplars of communications specialists without a strong introduction to the behavioral sciences.

UP TO SEVENTY PERCENT

A Report on the Development of
Occupational, Vocational, and Technical Education (OVT)
in
The Pittsburgh Public Schools

Louis J. Kishkunas, Pittsburgh Public Schools

Introduction

According to John Gardner, Secretary of Health, Education, and Welfare, modern American society needs both good plumbers and good philosophers. Education, he warned, must see to it that both our pipes and our ideas hold water. There was never a time in history when such universal concern and such abundant support were focused on skill-centered education in the cities of America. This report records the recent upheaval of vocational education in the Pittsburgh Public Schools and the new form in which it has been reconstructed. It reports the activities of the past three years and, at the same time, it also looks to the future.

Pittsburgh, like many other large cities, has responded to the need for updating and upgrading traditional vocational training. But Pittsburgh's were not changes just for the sake of change — they were changes born of careful and expert study and developed in harmonious partnership with the people and organizations the programs were to serve. They were "in tune" with the vast renaissance in the city which expanded Pittsburgh into a great research center and industrial management metropolis. There are few places in America where so many man hours and so much thoughtful study has been applied to determine the route for skill-centered education. After the new course of action was determined, massive efforts were expended to transform many of the programs from hopeful goals to reality.

The sweeping effect of the new program in Occupational, Vocational, and Technical Education has broght a major upheaval in the Pittsburgh Public School system during the past three years. The reality of the times now demands that at least seventy percent of the pupils in Pittsburgh must be served by this program.

Early Developments

Publication of the "Vocational Education Survey" (Dauwalder Report) in April of 1963, served to crystallize the long-standing concern of the Board, the Superintendent of Schools, and civic and industrial leaders about the place skill-centered education was occupying in the growth and renaissance of the Pittsburgh schools. The climate for constructive action was enhanced further by passage of the Vocational Education Act of 1963, which provided increased support from both state and federal sources. Extension and expansion of the Manpower Development and Training Act insured continued federal assistance and further development of the retraining programs which had become a substantial element of the OVT operation. Enactment of "anti-poverty" and other educational legislation strongly indicated that the Board would be expected to assume an enlarged role in the development programs for the disadvantaged. Finally, there was mounting evidence of community interest in the development of instructional programs that would insure the availability of the greatly enlarged and well trained labor force required for Pittsburgh's expanding and diversified economy.

At the time the "Vocational Survey" was begun, the Board was operating five traditional vocational high schools. Course offerings were limited to twenty-three trades and less than thirteen percent of the students at high school level were enrolled in these programs. The average age of shop equipment was thirty-seven years, and no systematic approach to upgrade the vocational curriculum had been made for nearly twenty years. Since less than thirty-five percent of Pittsburgh high school graduates normally continued their education past high school, it was clear that existing vocational programs were not reaching the large number of students they should serve. Also, it was evident that the employment requirements of business and industry in the area were not being met, either qualitatively or quantitatively.

In February of 1964, the Board took its first official step toward adoption of an OVT philosophy. Following recommendations of the first Off-Campus Seminar of key staff and faculty members, it provided for:

1. Development of three central "core" curricula, representated by the occupational, vocational, and technical combinations of academic and non-academic subject matter.

2. Adoption of an orderly transistion from the old traditional vocational schools to the comprehensive high school with OVT offerings usually limited to the 11th and 12th grades.

3. Further development of technical level instruction to be given in the 13th and 14th grades (this was tentative).

Concurrent with this renewed interest in vocational education, other areas of the school curriculum were being examined with a view toward upgrading. As a result of these efforts, a grant of $2,485,000 was received from The Ford Foundation; $102,800 of this grant was designated for specific projects and corresponding staff in OVT.

Immediately, the Superintendent of Schools was authorized to establish and fill the new position of Assistant Superintendent for OVT and implement these recommendations. This position was filled in May of 1964, and the Division of Occupational, Vocational, and Technical Education was formed.

An important element in the plan was to make the OVT programs available to the bulk of the non-college bound students. Since these students amounted to over seventy percent of the high school enrollment, it was apparent that appropriate programs must be moved into the academic high schools. Heretofore, the programs offered in the two types of high schools were separate and distinct; patterns of organizations were different; courses with similar titles often were completely different. It was apparent, however, that the two types of education were not mutually exclusive but could be combined into a comprehensive high School program. South Junior-Senior High School and South Vocational School were combined administratively and their student bodies merged in September of 1964. In January of 1965, Allegheny Vocational-Technical High School was combined administratively with Allegheny High School; their student bodies were merged in September of 1965. The programs of Washington Vocational and Arsenal Vocational were partially integrated to add comprehensiveness to their programs. These two schools are not accepting new students and will be phased out in 1967.

A major concern in the redesign of the OVT offerings was the creation of a mechanism which would ensure a continuing effectiveness of the new programs. Because much good counsel had been received from the citizens' advisory committee established to direct the survey in 1963, it seemed expedient to establish three levels of advisory committees to meet regularly with the staff to counsel them as to the appropriateness of course content, equipment, teacher requirements, and other such topics. An over-all policy advisory committee was appointed in September of 1964. Two second level committees, health and technical, were approved in March of 1965. More than 600 citizens are serving as advisory committee members on the fifty-one craft committees on a third level of committee structure.

A second Off-Campus Seminar was held in January of 1965, to further study the developments in OVT training as related to the total school system. This conference was attended by top administrators, selected principals, and guidance personnel. Here it was recommended that:

1. The Comprehensive High School, rather than separate vocational and academic institutions, be the organizational arrangement for OVT.

2. Job-centered training be reserved for the 11th and 12th grades, rather than starting at 9th grade.

3. Readily identifiable potential dropouts be admitted to skill-centered training programs at age 16, irrespective of the grade level of the student.

4. The middle school curriculum (grades 6, 7, and 8) include required exploratory career survey programs for all pupils.

5. Ninth and 10th grade Industrial Arts, Business Education, and Home Economics programs be exploratory in nature, leading to career selection in 11th grade.

6. Where appropriate, skill-centered training be extended to the 13th and 14th grades.

7. All programs lead to expected high school graduation.

8. Where appropriate, cooperative and work-experience programs become an integral part of the program.

9. Immediate, massive efforts be started toward curricula development in new programs consistent with the business and industrial needs of Western Pennsylvania in 1965.

10. Efforts be initiated toward building an in-service training program for OVT teachers and for all counselors and coordinators.

11. Information on these programs be made available to the public via all media.

12. Studies be made on the modification and addition of facilities to house these programs in the existing junior and senior high schools.

13. Every effort be made to tap all financial resources to make these programs a reality within the school system at the earliest possible date.

By September of 1965, all high schools had some of the forty-one different skill-centered programs as part of their regular curricula available to all students. Obviously, no school could house all programs, but availability to the student was ensured by allowing him to transfer to a high school offering the desired program or to attend a neighboring high school, on a part-time basis, for the desired skill-centered program. In order to accommodate this change in organization, it was necessary to extend the school day for many high schools to eight periods, with an appropriate block of time assigned to each program according to its particular needs. It became possible for a student to meet minimum college entrance requirements and to develop a saleable skill.

In 1963, only 2600 pupils (34.2 percent of the pupils in grades 11 and 12) were enrolled in the Business or Vocational Curricula. In the first year of operation of the new OVT division, over 40 percent were enrolled in the skill-centered programs. In the 1966-67 school year, the number increased to 5860 (58.5 percent) in skill-centered training. Thousands of other students were enrolled in general and exploratory courses.

A total of sixty-two skill-centered classes were added in 1965-66, with an additional forty-one in 1966-67.

Since its inception the OVT division has operated twenty-six special state and federal programs, for which an excess of ten million dollars of financial support has been received. This amount is in addition to the State reimbursement.

What Pittsburgh has accomplished is not just noteworthy for the size and quality of the program but also for the speed of the attainment. Much stimulation came from federal legislation which occurred simultaneously with the dramatic step forward by the schools. But even more important were the interest and direction given by the Pittsburgh Board of Public Education and the Superintendent of Schools.

The commitment to the comprehensive high school concept and the ability to discard tradition when it hampered the educational growth seemed to be the factors which were unusual. Other systems have used vocational surveys, development seminars, citizen advisory committees, promotional literature, an open transfer plan, an extended school day, and a planning staff. Strangely, abolishing the vocational schools increased the vocational enrollment.

As the Great High School program develops in Pittsburgh, and as the New Middle School project begins, the OVT responsibility becomes even greater. Every child should have an OVT exploratory experience in grades 6, 7, and 8; some students will desire a narrowed exploratory program in grades 9 through 12; and up to seventy percent of the 11th and 12th grade students need skill-centered training in order to make their high school training appropriate.

THE AMERICAN INDUSTRY PROJECT: DEVELOPMENT AND EVALUATION

Orville W. Nelson, Stout State University

I. Development and Present Status of American Industry

During recent years, there has been an increasing awareness of the many ramifications of the technological changes taking place in industry. New, more sophisticated jobs are emerging to take the place of those requiring less skill. Workers can no longer plan on remaining in one job during their working years. Even the man employed in a profession, although he may not change jobs, has to spend considerable time to keep abreast of the latest developments in his area. The pressures of the times have fallen not only on the workers but in turn have borne down upon education to provide the timely knowledges and skills needed to keep pace.

Most technological changes are sequential and have firm roots in the past. Automation represents an extension of mass production. Electronic data processing equipment takes over many of the functions formerly done on less sophisticated machines and also provides greatly increased capabilities to analyze and store information. Thus, if education keeps up to date with contemporary technology, change in the educational realm should also be systematic and sequential.

Unfortunately, there are several built-in mechanisms that tend to keep educational programs behind contemporary technology and knowledge. Such things as the lack of communication between the two worlds of industry and education, the outlook of the teachers, and the financial status of our schools tend to create an educational lag. However, the single largest inhibitor of change in education would appear to be the framework or rationale that provides the justification for each educational program, establishes boundaries for course content, and guides the development of courses within curricula.

Such a rationale is vital to any curriculum. Without one there would be chaos. However, a rationale also brings with it certain restraints on progress. New developments are viewed and analyzed in terms of the existing rationale; as a result, there is a substantial possibility that the essence of change may be missed. To illustrate this point, consider the nature of industrial arts. Its rationale emphasizes the learning of specific processes and techniques as an avenue to pre-vocational training and the development of a knowledge of industry.

Fifty to sixty years ago this rationale had considerable utility. However, as new materials and processes were developed and industry evolved into its present intricate form, this rationale has encountered increasing problems in accounting for the contemporary state of industry. Only so many courses can be fitted into a school curriculum. The proliferation of materials, for example, makes it impossible to include a course on each material (as had been done with woods and metals), or on the processes associated with each new material.

In 1962, this was the situation faced by a number of the staff members at Stout State University as they surveyed the existing industrial arts curriculum. After extensive study, this group delineated the following precepts for a rationale for the curriculum now entitled American Industry.

1. Industry furnishes the content to be studied. Industry in this context refers to an institution in our culture which, through the application of knowledge and the utilization of men, money, machines, and materials, produces goods or services to meet the needs of man, and which results in a profit for the institution or society.

2. In order to study industry, the diverse knowledges, activities, and functions encompassed in this realm have to be organized. Thus, there is need for the identification of a structure of industry.

3. Transfer of learning is a composite of identical elements and mental set.

    A. Therefore, concepts[1] learned through encounter with specific situations provide the most logical and effective elements to be learned in the study of industry.

    B. Therefore, a conceptual structure of industry should be developed to organize the concepts of industry.

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[1] The working definition employed by the Project . . . describes a concept as a psychological construct resulting from a variety of experiences (detached from the many situations giving rise to it), fixed by a word or idea, and having functional value to the individual in his thinking and behavior (Face and Flug. 1965).

Directed by these precepts, the members of this study group pursued the study of various structures. One of the major findings of this research was the discovery of the interrelated nature of all the concepts derived for the structure of industry. As a result, the group decided to depict the structure as a "ball" with fourteen sides. Each of the major concepts of industry was located on the periphery of the "ball" at a point formed by the intersection of two sides. The interrelations among the concepts are shown by the lines connecting the fourteen concepts with each other. A graphic illustration of this structure is given on the next page.

Another basic tenet of the Stout study group was that classroom teachers should be involved at an early stage in the design and implementation of this new program. With the aid of a grant from The Ford Foundation, ten industrial arts teachers were brought into the curriculum project which had been christened, by this time, the American Industry Project. These ten men worked with the co-directors, Wesley Face and Eugene Flug, during the summer of 1964 to develop the first course in American Industry.

Sufficient promise was evident during the 1964-65 school year to warrant a four-year grant from the United States Office of Education. This grant enabled the American Industry Project to expand to twenty teachers in fourteen different schools. The scope and nature of the project did not permit a rigid sampling in the selection of schools and teachers; however, a large city school system was contacted and agreed to cooperate with the American Industry Project. This gave a range of schools from a small rural town to a large urban area.

The U.S.O.E. grant also provided funds for additional staff members. A curriculum specialist was hired to plan instructional units, teacher materials, and student booklets. The talents of an audio visual media specialist were acquired to create instructional aids. Feedback on the effects of the units of study and instructional materials was needed. To accomplish this, two people were added to the staff. One visits the participating centers, observes the American Industry classes, and discusses the progress of the course with the participating teachers. The second man functions as a research specialist with responsibility for constructing needed evaluation forms and supervising the analysis and reporting of the resulting data. The other man added to the American Industry staff has responsibility for the development of a pilot teacher education program at Stout. In 1969, there will be twelve graduates from this program.

Course materials are being developed and evaluated by the Project staff and participating teachers in light of two general objectives:

1. To develop an understanding of those concepts which directly apply to industry.

2. To develop the ability to solve problems related to industry.

Each instructional unit has objectives stated in behavioral terms which emanate from these two primary objectives.

The first course in American Industry gives an overview of the nature of industry and how it operates. Students are introduced to the concepts of industry and some of the interrelationships among them. They also have an opportunity to start and operate their own business. Through this business they become aware of the fact that poor workmanship (processes concept) can reduce sales (marketing concept), and as a result lower profits (finance concept).

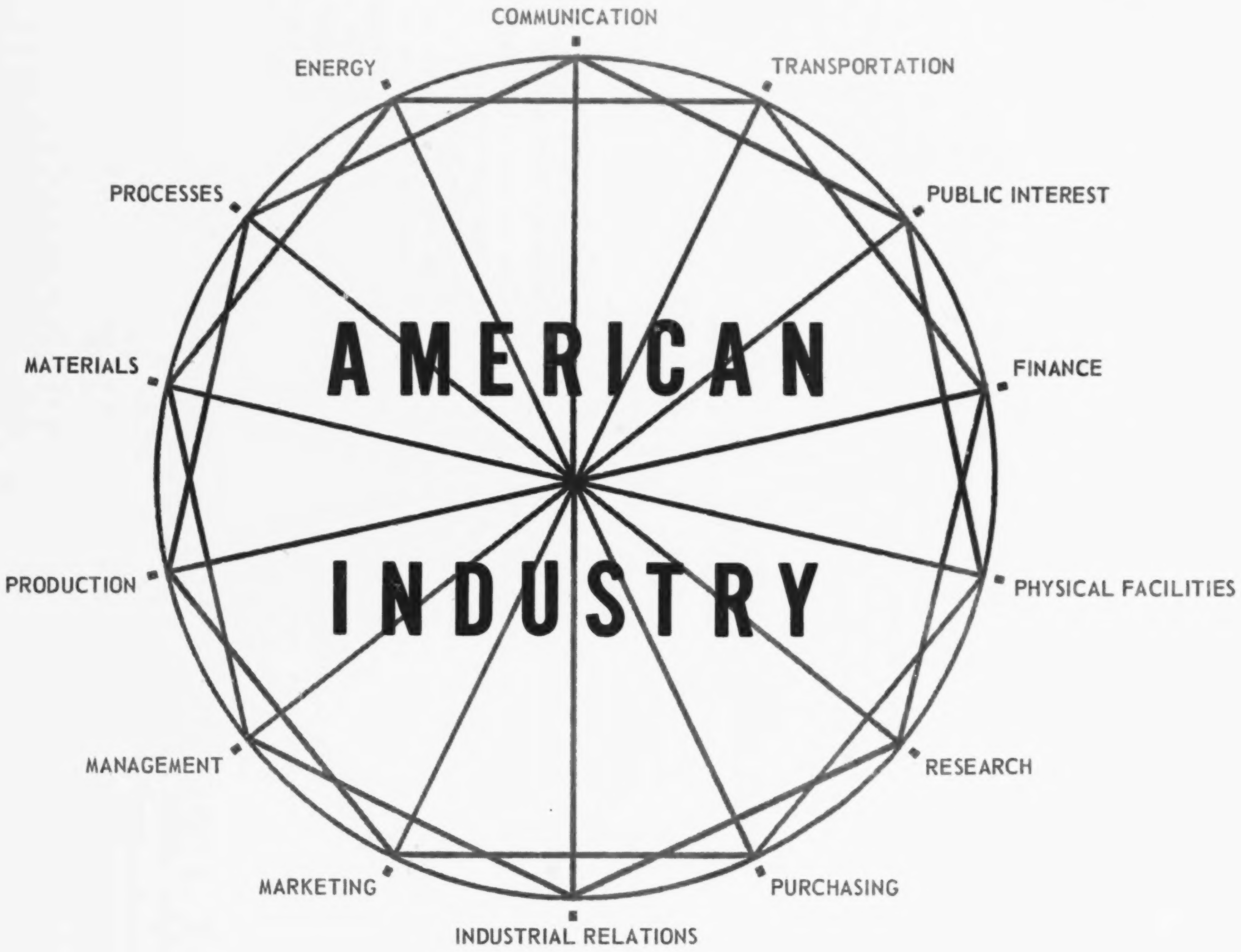
The major goal of the first level course is to build a general knowledge of the conceptual structure of industry, develop the ability to solve problems related to industry, and create an understanding of the relationship of industry to the lives of all members of our society. Thus, students in this course study processes rather than specific skills, and materials in place of woods or metals. In addition, they are exposed to such concepts as research, finance, management, and communications.

The first level course is being taught by nineteen teachers during the 1966-67 school year. Each teacher has been provided with an instructor's guide that details the learning activities and the sequence of instructional units. A set of seven booklets is provided for each student. At the end of the class term, each class is evaluated by the Project and compared to control classes which are not exposed to American Industry.

Four teachers are doing developmental work on the second level course. These men outlined a series of units for the course during the project's 1966 summer workshop. Now, they are trying out their ideas and keeping a record of what works and what needs to be revised. The objective of the second level course is to attain a more sophisticated understanding of the concepts of industry.

The American Industry Project also proposes a third course in which students could specialize in one or a related cluster of concepts. For example, a student might concentrate on the concepts of research, materials, and processes in order to acquire a better comprehension of these concepts and at the same time determine what process can be used with specific materials. This course will involve as much independent study as each student can profitably undertake.

Suggested grade placement of these three courses is Level I in grade eight, Level II in grade ten, and Level III in grade twelve. This represents the grade levels for which the student materials are being prepared. However, several of


COMMUNICATION
ENERGY
TRANSPORTATION
PROCESSES
PUBLIC INTEREST
AMERICAN
MATERIALS
FINANCE
INDUSTRY
PRODUCTION
PHYSICAL FACILITIES
MANAGEMENT
RESEARCH
MARKETING
PURCHASING
INDUSTRIAL RELATIONS

A CONCEPTUAL STRUCTURE OF THE KNOWLEDGES OF INDUSTRY the participating teachers are teaching Level I in the tenth and eleventh grades with success.

The American Industry approach differs considerably from industrial arts. This should be expected with the adoption of a new rationale. Development of a rationale requires considerable effort which results in a certain amount of ego involvement. Discarding a rationale requires that its proponents give up the fruits of this labor, the basic principles that guide their work, and acquire an entirely new set of precepts. This process is neither easy nor quickly accomplished. As a result, the prevailing rationale is modified and adhered to until it comes to a point where it obviously fails to provide the guidance necessary for the discipline to maintain its status.

The situation that provides the catalyst for a new rationale will have many of the dimensions of a crisis. Furthermore, the new rationale will have to account for all of the changes in knowledge and skill accomplished since the old rationale was formulated. Hence, one should expect the change of a new rationale to be somewhat drastic.[2]

Since a change in rationales has many disruptive effects, there may be some question as to whether development and utilization of a rationale are worth the cost in time and controversy. However, without a rationale, explicit or implicit, a discipline cannot help but flounder from lack of direction and wither from lack of unified effort on the part of its members. A logical rationale is a basic necessity to a dynamic discipline. What the educator has to be cognizant of is the fact that periodically there will be a need for a new rationale and that the resulting change will have some disruptive aspects.

The preceding pages have given an insight into the objectives and scope of the American Industry Project. The ensuing section will discuss the evaluation procedures utilized by the Project.

II. Evaluation

The evaluation procedures employed by the American Industry Project were designed to generate several types of data. First, there was a need to obtain descriptive data on the activities which emanated from the Project. These descriptive data provide feedback information which is essential for making many of the decisions connected with the daily and long-term functioning of the

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[2] One does not have to be the author of a rationale in order to be reluctant to give it up. Remember that considerable time is expended in learning the rationale before one is allowed to practice it.

Project. In addition, these descriptive data accumulate to form a history of the events accomplished. This history provides an important source of information for assessing the extent of agreement between the activities devised to reach the group's objectives and what actually transpired.

The second type of information required was comparative data related to the achievement of the objectives of the American Industry courses taught in the secondary schools cooperating with the Project. Students encounter many learning experiences both in and outside of school that might have some influence on their knowledge and understanding of industry. Thus, the magnitude of the effect that results from the formal study of American Industry has to be assessed in relation to students who are not in these courses. Control groups were secured to provide a basis for making these comparisons.

Now that the general uses of information pertaining to the Project have been identified, attention can be focused on the sources of these data. Three specific domains of data appear to be the appropriate concern of the American Industry Project. These three domains have been entitled "ingredients," "processes," and "products."

Scope of the Evaluation

"Ingredients" refers to all of the factors brought to the learning situation by the several agents involved. An initial factor is the instructional materials designed for the American Industry curriculum. These materials include resource books for the teachers, the teacher's guide, and the student materials. Since these materials are based on the structure of industry and the concepts derived by the Project, this structure and the concept models also have to be evaluated and verified.

Characteristics of the students to which American Industry is taught represents another ingredient. Their abilities, interests, and knowledges will have considerable influence on what is accomplished. In like manner, the nature of the teacher will play a vital role, thus forming another ingredient. Finally, the school and the community in which it functions will exercise considerable influence. Such factors as the monetary resources of the community and the educational philosophy of the school have a marked effect on any educational program and especially on an experimental one.

The "processes" domain encompasses the teaching acts, learning activities, and school organization imposed on the ingredients for the purpose of accomplishing a set of objectives. This category refers to ongoing activities entailed in the study of American Industry in the secondary schools. It focuses on the dynamics of the classroom situation and the interactions among the ingredients involved in establishing and teaching a class in American Industry. Thus, the actions of a reticent department head are as much a part of this domain as the interaction between teacher and students during a class discussion.

"Products" forms the last domain for the evaluation and it embraces the outcomes of the study of American Industry. Student knowledges, understandings, skills, attitudes, and interests are facets of this area. In addition, the attitudes and knowledges of the American Industry teachers constitute attributes worthy of evaluation in this realm.

Figure 1 is presented below to give a clearer conception of the relationship of these three domains in the evaluation of the American Industry Project. Note that the horizontal arrows connect the "ingredients" to the "products" to graphically indicate the role of the "processes." The vertical arrows denote the possible interactions among the processes.

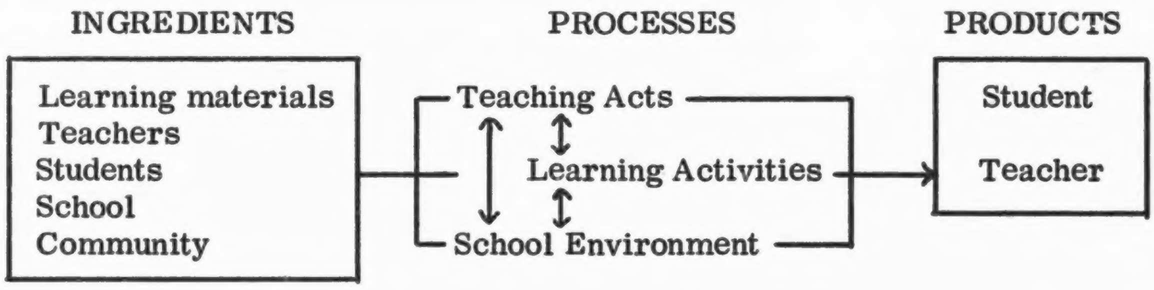

Figure 1

FACTORS ENCOMPASSED IN THE EVALUATION OF THE AMERICAN INDUSTRY PROJECT

Evaluation Instruments and Procedures

Ingredients. First drafts of the American Industry Project's structure of industry and the models for the concepts in this structure were distilled through an extensive and detailed review of literature. Once this had been done, the structure and models were submitted to a number of individuals associated with industry. These consultants to the Project were employed in a variety of service and production industries. Each consultant received the structure and a model and gave his evaluation of them. Several educators closely associated with industry were also contacted.

It is important to note that a variety of industries are represented in this sample. The Project was interested in defining concepts that were representative of all types of industries. In order to do this, the criticism, thoughts, and ideas of people with assorted vocational experiences were solicited.

Even though a heterogeneous sample of industrial people was contacted, the Project was also committed to developing a unified discipline centered on the study of industry. A basic tenet of the Project holds that the major ideas utilized in individual American businesses are similar enough to be effectively and efficiently studied as a part of one unified structure. For example, the basic ideas in management are the same whether you operate a retail store, manage a large factory, or run a farm.

To accomplish a unified structure, the Project staff studied the verbal and written comments of the consultants. As new insights were obtained, they were incorporated into revised editions of the concept models. These revisions were then submitted to additional consultants. The Project intends to continue this process of consultant evaluation in order to refine the structure of industry and the concept models and keep them current with the best thinking in industry.

During the past three years, the participants in the American Industry Project have developed a number of teaching materials. The teacher resource books and lesson plans are evaluated through the comments and suggestions made by the participating teachers. A reporting form has been distributed to the teachers for use in giving their general impressions of these materials. Specific comments are made in the material at the point they apply. After an instructional unit is completed, the materials for the unit are returned to the Project where the comments are recorded and analyzed.

The student booklets written for the American Industry courses are evaluated through student and teacher comments. Each student completes a rating scale on each booklet. Responses to statements on the reading level, content, degree of interest in the material, and format of the booklet are requested. The reading level comments will be compared with the student's reading ability and the reading level of the book as measured by the Dale-Chall formula (Dale and Chall, 1948).

American Industry students are encouraged to make specific comments in their booklets and to underline words they do not comprehend. Observations by the participating teachers are also requested. As the teachers read the booklets in preparation for presenting the lessons, they are watchful for errors of commission and omission.

Information related to the education, work experiences, and teaching experiences of the participating teachers was collected through the use of a questionnaire completed when applications for the teaching positions were made. Further background information was obtained from interviews with the applicants and a review of their college records. After the teachers were selected, their teaching competencies were strengthened through a series of micro-teaching sessions. During these sessions, the teachers presented five to ten minute American Industry lessons to groups of four or five junior high school students. These students rated their teacher. The video tape of the session was then played back to the entire Project staff. As the playback was viewed, the staff completed the Stanford Teacher Competence Appraisal Guide (Stanford University School of Education). One copy of the Appraisal Guide was given to the teacher and one copy was retained for the Project's files. After the video tape had been viewed, the micro-teaching session was discussed by the group and suggestions were given for improving the presentation.

Several types of data are collected on the participating students. Each student involved in the evaluation of an American Industry course answers a series of items which pertain to his interests, work experience, family background, and school experience. In addition, the participating schools release the standardized achievement and ability test data to the American Industry Project. This information provides a good description of the student's ability, achievement, social-economic status, experiences, and interests.

In those schools in which the experimental and control classes cannot be composed by random selection, the students are pretested on their knowledge of industry. When pretesting is done, one-half of the students receive the test developed by the Project to measure knowledge of industry and the others take a test based on industrial arts content. The two tests are randomly distributed to the students being tested. This procedure permits a determination of the degree of reactivity associated with the pretesting.

Information on school characteristics is obtained from several sources. The participating teachers submit copies of their teacher handbooks, class schedules, and student handbooks. They are also required to complete a questionnaire which contains items selected from Project TALENT's School Questionnaire. These items pertain to the students' education aspirations, the financial status of the school, and the educational program offered. Further information on the schools comes from photographs and reports from the Project's staff members who have visited the schools.

Descriptions of the communities that support the participating schools are written by the teachers. To supplement this, the Project obtains phone books and city directories for these communities. In some instances, literature or brochures developed by civic or business organizations are also available.

Processes. Direct observation of the American Industry classes by Project personnel provides the basic data for evaluating the processes involved in the study of American Industry in the secondary school. Use of the Stanford

Teacher Competence Appraisal Guide produces a systematic and consistent set of observations on each participating teacher. This rating scale directs the observer to consider the aims and planning encompassed in a lesson and the quality of the presentation. The Appraisal Guide also focuses the attention of the observer on the interactions between the teacher and his class. Pupil-teacher rapport, pupil participation, and the pacing of the lesson are rated.

The last section of the Appraisal Guide concerns the relationship between the participating teacher and the other staff members in his school. Specific items in this section deal with the teacher's concern for the total school program and the work of his colleagues. Ratings on this portion of the scale are made on the basis of the observer's conversations with the participating teacher, administrators, and other staff members in the school. The observer will frequently have an opportunity to view teacher-administrator and teacher-teacher relationships in formal meetings or in informal sessions in the faculty lounge.

In addition to completing the Appraisal Guide, the observer records general comments on the classes observed and the school environment. The progress of the American Industry classes is noted and the lessons studied during the visit are recorded.

Additional information on the teaching acts and learning activities accrues in the lesson plans and comments made by the participating teachers. Also, the rating scale for the student booklets requests the students to indicate the extent of their utilization of the booklets. A more subtle measure of the usage of the booklets is the extent of wear evident on the booklets.

All of the data in this realm reflect the degree of success achieved with the materials and lesson plans developed by the Project. Furthermore, they indicate the extent to which the original lesson plans and course plans were followed by the participating teachers.

Products. Several products are of primary interest in the evaluation of the effects of the study of American Industry. Immediate feedback is received from an achievement test constructed by the Project. This test presents sample industrial problems to the students along with more factual items. Several items which assess the ability to think conceptually about industrial situations are also included. This test was constructed to measure the objectives delineated by the American Industry Project. The achievement test will also be administered to a sample of industrial employees to ascertain if it distinguishes between the adaptable and successful workers and those who receive low performance ratings.

Student reactions to the American Industry courses are requested on a free response form. The first part of the form asks the students to rank the courses they like and give the reasons for their attraction to the courses. In the second part, the students rank the courses they dislike and state their reasons for disliking them.

Egan[3] found that the 1965-66 American Industry students "liked" their American Industry course as much as the other courses in their class schedule. However, he also received significantly fewer negative rankings and comments related to the American Industry courses. In the last part of his questionnaire, Egan asked each student to relate what he liked and disliked about the American Industry course in which he was enrolled. In brief, the students liked the utility, the characteristics of their teacher, and the learning activities employed. Dislikes were associated with the personality of the teacher and the lack of adequate learning activities in some units of study. Since there were significantly fewer dislikes stated for the American Industry courses in comparison with other courses in the students' schedules, the judgment of these students appears to be very favorable.

The Project is also interested in the vocational behaviors of the students in its sample. At the close of each American Industry course the students involved in the evaluation record their vocational preferences on the Project's Occupational Preference Form. They also indicate the reasons for their choice, how they intend to prepare for the occupation, and who influenced them to make their choice. For the most part, however, collection of data in this realm will be a long-term task.

A follow-up study has been funded for 1970. It is the hope of the Project staff that a more extensive follow-up study may be undertaken. Most of the questions associated with the influence of the study of American Industry on vocational behavior will require data from the vocational experiences encountered during the first five to ten years out of high school. Of special importance will be the career patterns of students in the evaluation.

A longer follow-up study would permit an evaluation of the exploration period of vocational behavior and the initial phase of the establishment stage. Moreover, a follow-up study over this period of time would probably span at least two business cycles. And, it would not be as vulnerable as a short-term follow-up to an event such as an increase in the military draft. In any event, vocational behaviors will have to be analyzed and judged in light of the existing level of the economy and any other factors that might influence job entry and advancement.

The students' grades in the American Industry courses are submitted to the Project by the participating teachers. A part of the 1966 summer workshop was devoted to in-service instruction in evaluation. In addition, the teacher materials contain suggested evaluation techniques. Hence, these grades should reflect, to a fair extent at least, the attainment of course objectives.

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[3] Egan, E.M., A Study of Student Attitudes in American Industry, unpublished Master's thesis, Stout State University, 1966.

A number of the actions of the participating teachers indicate that they have been influenced by their exposure to American Industry. Several have taken an interest in investing in the stock market. And, two men resigned from the Project so that they could start their own businesses.

Changes in the professional interests and activities of the teachers have also been noted. Calls have been received by the Project for information which was not available in the local community but which was needed to complete a research activity. Recent questions by the teachers have given evidence of an increased awareness and interest in the philosophical and practical problems in industrial education.

Some special evaluation techniques are being investigated for use in the Project's evaluation program. For example, a free association method of analyzing meaning is being tried out during the 1966-67 school year. Also being tried are tape recorded interviews with selected students.

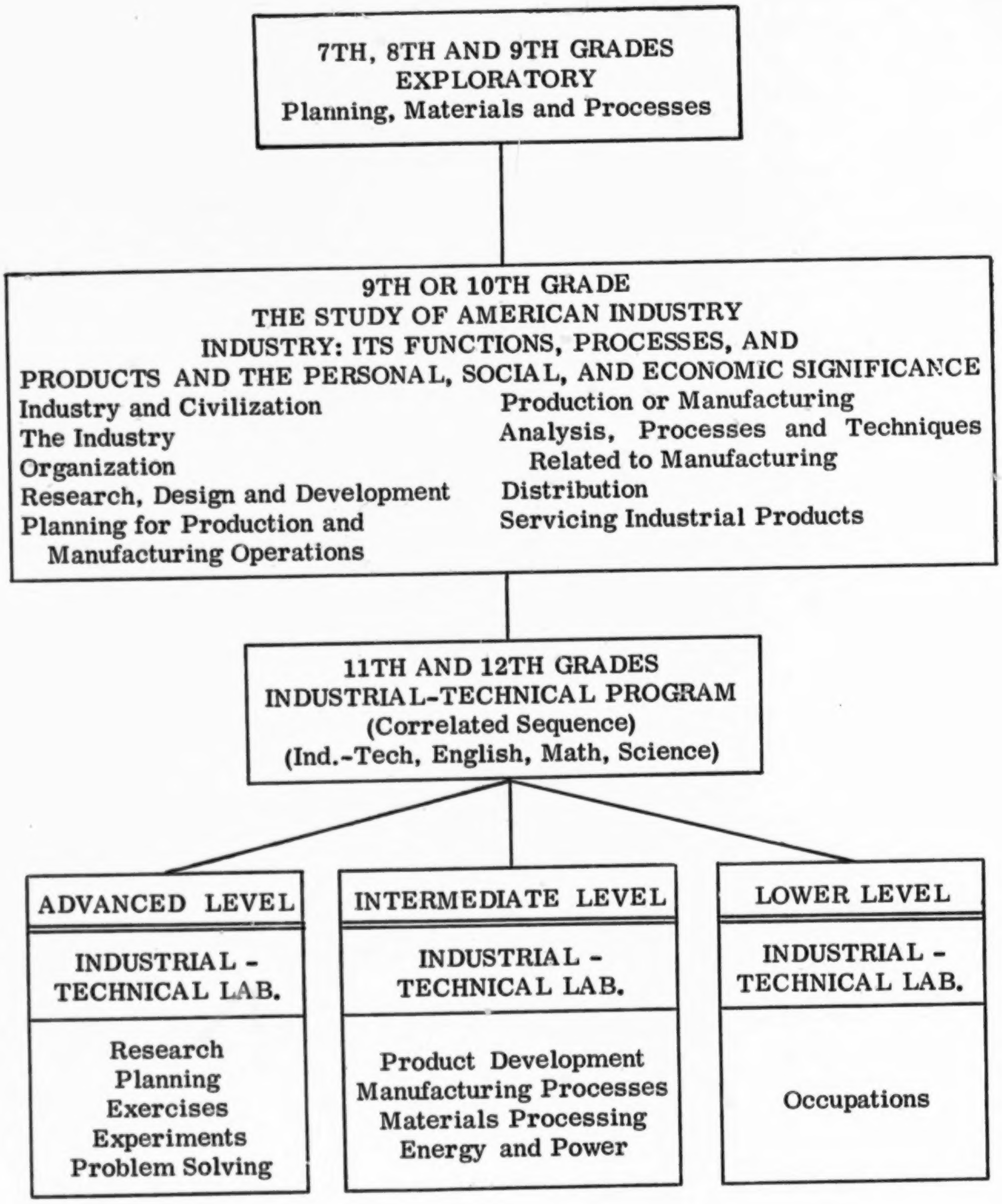
The previous paragraphs have described the data collected on the "products" associated with the study of American Industry. However, there is more to evaluation than collecting data. Appropriate analyses have to be carried out to isolate the facts embodied in the data collected. Note that a variety of instruments are being employed to gather data. This approach was selected to avoid the singular bias of any one measuring technique.

Three different categories of evaluation are being utilized by the American Industry Project. The knowledges, skills, and understandings which result from the study of American Industry are compared with the objectives stated for the courses. The purpose of this evaluation is to describe the extent to which the objectives are attained. American Industry students are also compared to students who do not enroll in these courses. This is done to assess the magnitude of the effect of the formal study of American Industry. Two levels of comparison, experimental and quasi-experimental, are included in the evaluation program. In as many participating schools as possible, arrangements are made for an experimental design. However, this has proved to be impossible in some settings and a quasi-experimental design has had to be employed. At the present time there are seven experimental settings and six quasi-experimental.

For the most part, the participating schools were not selected on the basis of a sampling plan. Thus, a question can be raised concerning the representativeness of the results obtained in these schools. In recognition of this circumstance, two decisions were made. First, as much information as possible would be collected on the characteristics of the students participating in the evaluation. To obtain information that would be amenable to comparison with existing data permission was obtained from Project TALENT to utilize several of their information forms. Through this procedure the Project will attempt to determine how typical or atypical its students and schools are.

The second decision was to treat each school as a separate experiment and analyze results in terms of the specific school setting. Moreover, no attempt would be made to generalize to schools not in the sample. Rather, the results will be reported in detail, and any school considering the adoption of the American Industry curriculum will have to consider this evidence in relation to the nature, philosophy, and goals of their school system.

A CURRICULUM FOR INDUSTRIAL-TECHNICAL EDUCATION FOR PARTICIPATING SCHOOLS



7TH, 8TH AND 9TH GRADES
EXPLORATORY
Planning, Materials and Processes

9TH OR 10TH GRADE
THE STUDY OF AMERICAN INDUSTRY
INDUSTRY: ITS FUNCTIONS, PROCESSES, AND PRODUCTS AND THE PERSONAL, SOCIAL, AND ECONOMIC SIGNIFICANCE

- Industry and Civilization
- The Industry
- Organization
- Research, Design and Development
- Planning for Production and Manufacturing Operations
- Production or Manufacturing
- Analysis, Processes and Techniques Related to Manufacturing
- Distribution
- Servicing Industrial Products

11TH AND 12TH GRADES
INDUSTRIAL-TECHNICAL PROGRAM
(Correlated Sequence)
(Ind.-Tech, English, Math, Science)

ADVANCED LEVEL
INDUSTRIAL - TECHNICAL LAB.
Research
Planning
Exercises
Experiments
Problem Solving

INTERMEDIATE LEVEL
INDUSTRIAL - TECHNICAL LAB.
Product Development
Manufacturing Processes
Materials Processing
Energy and Power

LOWER LEVEL
INDUSTRIAL - TECHNICAL LAB.
Occupations